

Site: MARTHA ROSE  
ID #: MOD 980633069  
Break: 3.5  
Other:  
2/1/1990

REPORT ON THE  
REMEDIAL INVESTIGATION  
OF THE  
ROSE CHEMICALS SITE  
HOLDEN, MISSOURI

APPENDIX C - EXISTING DATA VALIDATION TECHNICAL MEMORANDUM

FOR  
CLEAN SITES, INC.  
VOLUME IV

February, 1990

88-025-4

Burns & McDonnell Engineering Company  
Engineers-Architects-Consultants  
Kansas City, Missouri



40025293  
SUPERFUND RECORDS

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PART I  
INTRODUCTION

This technical memorandum was prepared to satisfy the requirements of Section 5.1 of the Final Work Plan for Remedial Investigation/Feasibility Study at Rose Chemicals Site in Holden, Missouri. The purpose of this technical memorandum is to compile, assess, and validate all existing data in support of the remedial investigation (RI) and feasibility study (FS) being conducted for the Rose Chemicals Site (Site), Holden, Missouri.

Each of the following Parts contains information concerning a specific matrix. The matrices include: surface soil, sediment, subsurface soil, soil gas, surface water, groundwater, air, and animal tissue. Parts are further subdivided into sections for review of each contractor/agency who performed sampling of that matrix, if appropriate. The three remedial contractors and one government agency that conducted investigations on and around the Site were O.H. Materials Company (OHM); Chemical Waste Management, Inc. (CWM); John Mathes and Associates, Inc. (JMA); and the Missouri Department of Natural Resources (MDNR), respectively. A summary of the contractor/agency specific data is presented in each section.

The presentation of the data quality objective begins the data validation of each specific matrix. The sampling objective sets the sampling and analytical methods necessary to provide the required data quality and quantity. Generally, the data quality objective of the OHM sampling events was data of appropriate quality to establish health and safety precautions during on-site activities. CWM's data

quality objective was to obtain data which enabled the characterization of the surface soil on-site, and to gather preliminary characterization data on other matrices. JMA's data quality objective was to collect data to assist the Rose Chemicals Steering Committee (RCSC) in developing a qualitative and semi-quantitative characterization of the Site. This characterization, in turn, was used to estimate remedial costs in support of the buy-out offer to smaller Potentially Responsible Parties (PRPs). The MDNR's data quality objective was to determine the presence or absence of PCBs in East Pin Oak Creek and its unnamed tributary. In most cases, usability conclusions are made based upon the data quality objectives.

A more detailed validation of the CWM surface soil data was conducted to allow its use for all RI/FS purposes. The sampling methods, chain-of-custody records, preservation techniques, and holding times are reviewed. The analytical methods and method detection limits are also examined to establish the analytical level used to generate the data. Langston Laboratories of Leawood, Kansas performed the analyses of the investigative samples. The analytical methods used are in Appendix A.

A review of data precision, accuracy, representativeness and comparability concludes the data validation of the CMW surface soil data. Precision is usually stated in terms of standard deviations, and is a measure of reproducibility of analytical results. The results of duplicate samples are used to determine

analytical precision. The quality assurance/quality control (QA/QC) analytical data provided by Langston Laboratories are in Appendix B.

Accuracy is a measure of the nearness of an analytical result to the true sample concentration. Accuracy is assessed by examining the instrument calibration and matrix spikes. The data were provided by Langston Laboratories and are contained in Appendix B. Tables for calculating limits of expected accuracy and precision for the various parameters are included in Appendix C. These tables are from Test Methods for Evaluating Solid Waste, U.S.EPA-SW-846, 1986.

Representativeness is a qualitative parameter which expresses whether the sample data represent a desired condition. At the Site, the condition is environmental contamination. This is addressed by describing sampling techniques, locations, and times.

Comparability is a qualitative parameter which expresses the confidence with which one data set can be compared to another. Sample data should be comparable with other measurement data for similar samples and sampling conditions. Comparability is achieved through the use of standard sampling and analytical techniques.

Usability conclusions for the CWM surface soil data are assigned based upon the validation results. The validation results indicate that the data may be used for RI/FS purposes other than described in the CWM sampling objective. Data uses may include:

- o health and safety evaluation
- o site characterization
- o evaluation of alternatives
- o engineering design
- o risk assessment

Guidance for evaluating data quality was obtained from Data Quality Objectives for Remedial Response Activities: Development Process, U.S. EPA, March 1987.

Several sources of information were used during the validation effort. They include:

- o Project Schedule, Inventory Plan, Sampling Plan, QA/QC Plan - Rose Chemicals, Holden, Missouri, Chemical Waste Management, Inc., ENRAC Division.
- o Sampling/Analytical Survey - Rose Chemicals Site, Holden Missouri, Dr. Harry V. Drushel, CSI, June 12, 1987.
- o Preliminary Site Assessment Report - Rose Chemicals Project, Holden, Missouri, Site Investigation, by John Mathes & Associates, Inc., July 31, 1987.

- o Preliminary Site Assessment Report, Addendum Number 1 - Rose Chemicals Project, Holden, Missouri. Site Investigation, John Mathes & Associates, Inc., October 30, 1987.
- o Various historical QA/QC data from Langston Laboratories Inc., Leawood, Kansas.
- o Missouri Department of Natural Resources memorandum from Connie Knight to Jim Penfold regarding analytical results from sampling activities at Holden, Missouri.

## PART II

### SURFACE SOIL DATA

Surface soil data were generated by three contractors' efforts at the Site from September of 1986 through September of 1987.

#### A. O. H. MATERIALS COMPANY

##### 1. EXISTING DATA

In September, 1986, OHM took surface soil samples from the Site perimeter and at biased locations on the Site and at background locations in Holden, Missouri. The data are contained in Appendix D.

##### 2. DATA QUALITY OBJECTIVE AND APPROACH

The objective of this sampling event was to provide data of sufficient quality to assist in the determination of health and safety precautions necessary to carry out on-site work activities. Composite surface soil samples were collected between points around the perimeter of the Site. Grab samples were taken at biased locations on the Site to determine whether levels of PCB concentrations increase closer to the buildings. Background samples were also taken from several locations in Holden.

##### 3. USABILITY CONCLUSIONS

The data quality objective of this sampling event was achieved. Data was gathered which assisted in the establishment of on-site worker

protection levels. The data also assured the general public that there was no immediate health threat to the community.

The sampling methods used by OHM did not provide data of sufficient quality to allow characterization of areas as did subsequent sampling events. Rather, the OHM samples were either grab samples or composites along the Site perimeter. The results are not comparable to data generated later and, therefore, are suitable for health and safety evaluation and qualitative site characterization only.

B. CHEMICAL WASTE MANAGEMENT, INC.

1. EXISTING DATA

From October of 1986 through early May of 1987, CWM conducted a comprehensive soil sampling program at the Site. The data are contained in Appendix E.

2. DATA QUALITY OBJECTIVE AND APPROACH

The objective for this phase of work was to obtain data of sufficient quality to fully characterize the areal surface soil contamination at the Site. The approach for the first round was to divide the Site into 50-foot by 50-foot grids, to obtain twenty-five aliquots from each grid, and to composite the aliquots into one sample per grid. Based upon the first round results, a second round further divided selected 50-foot grids into four 25-foot by 25-foot grids.

The objective and approach is specifically described in Section 3.0 of Project Schedule; Inventory Plan; Sampling Plan; QA/OC Plan; Rose Chemical, Holden, Missouri, CWM, Inc., ENRAC Division.

### 3. SAMPLING AND ANALYSIS INFORMATION

#### a. Sample Collection Method

Twenty-five aliquots were obtained from an evenly spaced five by five distribution of sample locations within each grid. From each sample point, approximately equal amounts of soil were taken from a depth not exceeding one inch. An aluminum or teflon scoop was used to obtain the aliquots. The aliquots were collected in a common container. After all aliquots were collected, they were mixed to form one homogeneous sample. A portion of this sample was submitted for analysis.

#### b. Chain-of-Custody

Samples were collected and shipped to Langston Laboratories at the end of each day. The samples were transported to the laboratory by CWM personnel. Samples were logged into laboratory custody upon receipt or on the next business day. Chain-of-Custody records were filled out and utilized for each shipment of samples except one. That one shipment was sent with a non-standard Chain-of-Custody form (a handwritten memorandum which did not address sample date, type, or analyses required).

c. Sample Preservation Techniques

Samples were stored in coolers, but were not refrigerated.

d. Analytical Method

Langston Laboratories of Leawood, Kansas performed the analyses of the samples for PCBs. The analytical method used was a modification of Method 8080 from the Test Methods for Evaluating Solid Waste U.S. EPA SW-846, 1986. The modified method summary is included in Appendix A.

e. Holding Times

The holding time limits established by the analytical Method 8080 are to extract the sample within seven days and to analyze the extract within 40 days of sampling. Conversations with Langston Laboratories and analyses records indicate that all samples were extracted and analyzed within the recommended holding time limits.

f. Method Detection Limit

The detection limit for the PCB analyses was 0.2 mg/kg soil.

4. DATA EVALUATION

a. Precision

The standard deviation of each set of duplicate analyses was calculated. These standard deviations were compared to the expected single analyst standard deviation ( $s_r$ ) calculated from Table 4 of Method 8080 (see Appendix C). The equations of Table 4 were

developed for use with water matrix analyses. Therefore, the expected standard deviations calculated from Table 4 are conservative and are less than would be expected for a soils matrix. Duplicate analytical results were of acceptable precision if the calculated standard deviations were less than the expected standard deviations from Table 4.

The Langston Laboratories records indicated that 39 duplicate sample sets were analyzed for Aroclor 1242 from a total of 419 soil samples. Of these duplicate sets analyzed, seven had actual standard deviations which exceeded the limits calculated from Table 4 of Method 8080. In each case, the PCB concentration did not exceed 4.1 mg/kg soil. Variances in precision appear to occur only at low PCB concentrations.

The Langston Laboratories records indicate that seventeen duplicate sample sets were analyzed for Aroclor 1260. Of these duplicates, four of the actual standard deviations exceeded the limits calculated from Table 4 of Method 8080. In each case, the PCB concentration did not exceed 8.7 mg/kg soil. Again, variances in precision appear to occur only at low PCB concentrations.

b. Accuracy

Reference standard results were reviewed to assess analytical accuracy. Reference standard results are used to quantify the PCBs in each sample and were run not less than once per five environmental sample analyses. The reference standard results

indicate that the analytical system remained in control, and variations in equipment response were monitored and incorporated into PCB quantification.

Accuracy was also assessed by reviewing matrix spike sample results. The acceptable percent recovery ranges for Aroclor 1242, 1254, and 1260 are listed on Table 3 from Method 8080 (See Appendix C). The Langston Laboratories records indicated that nine samples were spiked with Arclor 1242, eight samples were spiked with Aroclor 1260, and two samples were spiked with Aroclor 1254. Sample Quad-6 did not meet acceptance criteria for Aroclor 1242. However, the total PCB concentration detected in the sample was 2.5 mg/kg soil and therefore, this particular outlier is of no significant concern.

Samples Quad-26 and Quad-38 did not meet acceptance criteria for Aroclor 1260. The grid that Quad-26 was taken from was resampled during CWM's second round of sampling which confirmed the first round sample (no order of magnitude difference). The total PCB concentration detected in Quad-38 was 1.4 mg/kg, and, therefore, this particular outlier is of no significant concern.

c. Representativeness

Samples were composites of aliquots taken from equally spaced locations taken using a consistent grid pattern over the entire Site. The sample results are representative of the Site contamination.

d. Comparability

These samples were taken to represent an areal extent of contamination and would, therefore, only be comparable to other sampling events which utilize equivalent sampling methods.

5. USABILITY CONCLUSIONS

Discussions with Langston Laboratories revealed that the spiking of samples was not part of their standard QA/QC protocol for PCB analyses at that time. The samples that were spiked and sampled were done at the laboratory's discretion as a check of analytical accuracy. All of the spike results are from samples submitted during the first round of sampling (50-foot by 50-foot grids). Spike samples were not analyzed from the second round of sampling based upon the satisfactory performance of the first round spike results. Only duplicate analyses results are available for the second round of sampling. The analytical system remained in control based on reference standards results. Although this data was not collected to support RI/FS activities, it is concluded from the available QC data that these data are of sufficient quality to be used for all data uses presented in Part I.

C. JOHN MATHES & ASSOCIATES, INC.

1. EXISTING DATA

During September of 1987, JMA performed limited surface soil sampling along the southern portion of the Site. The data are contained in Appendix F.

2. DATA QUALITY OBJECTIVE AND APPROACH

The objective of this sampling event was to obtain data of sufficient quality to assess potential surface water Site exit points for presence of VOCs. As described in Part I, this data was to provide qualitative and semi-quantitative information for use in estimating remedial costs in support of the buy-out offer to smaller PRPs. The approach was to obtain soil samples at locations where on-site runoff was likely to exit the Site. The sample having the highest concentrations of VOCs would then be analyzed for all parameters on the U.S. EPA priority pollutants list.

3. USABILITY CONCLUSIONS

The data quality objective of these sampling events were achieved and, therefore, the data should only be used for qualitative site characterization.

\* \* \* \* \*

PART III  
SEDIMENT DATA

Existing sediment data were obtained by MDNR, OHM, and CWM. The MDNR data were obtained in September and October of 1985. The OHM data were obtained in September of 1986. The CWM data were obtained during February and March of 1987.

A. MISSOURI DEPARTMENT OF NATURAL RESOURCES

1. EXISTING DATA

The existing data obtained by the MDNR consists of results from ten sediment sample analyses. The data are contained in Appendix G.

2. DATA QUALITY OBJECTIVE AND APPROACH

This sampling was conducted to respond to a complaint received by the Missouri Water Pollution Control Program regarding suspected dumping of PCB materials by Martha C. Rose Chemicals, Inc (ROSE). The data was to be of sufficient quality to determine if contamination existed and, if it did, determine its source.

The first round of sampling consisted of a single sediment sample at the property line downstream of the storm water outfall from the Site in the unnamed tributary of East Pin Oak Creek. The second round of sampling was a more comprehensive event involving sampling of sediment in the Holden sanitary sewers as well as several locations along the unnamed

tributary to East Pin Oak Creek, East Pin Oak Creek, West Pin Oak Creek, and the South Fork of the Blackwater River. Samples were taken both upstream and downstream of the Site.

3. USABILITY CONCLUSIONS

These data were not collected for RI/FS purposes, and the samples were obtained in the fall of 1985. Since the areas systems sampled are dynamic systems and releases to the areas are known to have occurred subsequent to the sampling event, it is concluded that this data is unusable for RI/FS purposes due to its lack of representativeness of current conditions. The data, however, may provide historical insight into current conditions.

B. O. H. MATERIALS COMPANY

1. EXISTING DATA

The existing data obtained by OHM consists of results from ten sediment sample analyses. The data are contained in Appendix D.

2. DATA QUALITY OBJECTIVE AND APPROACH

The purpose of this sampling was to obtain data of sufficient quality to characterize PCB contamination in the unnamed tributary to East Pin Oak Creek. The tributary runs along the southern border of the Site.

Samples were to be taken upstream of the Site, along the Site, and downstream of the Site. A sample was also to be taken at the storm sewer outfall from the Site which empties into the unnamed tributary.

3. USABILITY CONCLUSIONS

Since these data were obtained in the fall of 1986 and the system sampled is dynamic, it is concluded that these data are unusable for current RI/FS purposes due to their lack of representativeness of current conditions. The data also may provide historical insight into current conditions.

C. CHEMICAL WASTE MANAGEMENT, INC.

1. EXISTING DATA

The existing data obtained by CWM consist of results from eleven sediment sample analyses. The data are contained in Appendix E.

2. DATA QUALITY OBJECTIVE AND APPROACH

The objective of this sampling was to obtain data of sufficient quality to characterize the PCB contamination in the sediment at the bottom of the on-site storm water and spill containment ponds. This was accomplished by taking sediment samples around the perimeter and at the center of the on-site retention ponds.

3. USABILITY CONCLUSIONS

The data quality objective of this sampling event was achieved, and therefore the data should only be used for qualitative or semi-quantitative site characterization. The data quality precludes its use for any other RI/FS activities.

\* \* \* \* \*

PART IV  
SUBSURFACE SOILS DATA

A. EXISTING DATA

All subsurface soil data were obtained by JMA during their on-site investigations. Several unique sampling events produced this data. The events were: sampling of three test borings advanced to bedrock, sampling of shallow soil borings at 25 locations across the Site, sampling of shallow soil borings beneath the Main Building floor at eight locations, and sampling of soil borings advanced to bedrock beneath the buildings' floors. The data obtained from these sampling activities are presented in Appendices H, I, J and K, respectively.

B. DATA QUALITY OBJECTIVE AND APPROACH

The objective of these sampling events was to obtain data of sufficient quality was to evaluate the vertical migration of potential contaminants. These data were to provide qualitative and quantitative information for use in estimating remedial costs in support of the buy-out offer to smaller PRPs. The boring locations were chosen based upon previous investigations or proximity to potential migration pathways.

C. USABILITY CONCLUSIONS

The data quality objective of this sampling event was achieved, and therefore the data should only be used for qualitative or semi-quantitative site characterization. The data quality precludes its use for any other RI/FS activities.

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## PART V

### SOIL GAS DATA

An abbreviated validation procedure was used for these data since the objective of its collection was stated to be for site characterization and screening.

#### A. EXISTING DATA

Soil gas samples were taken at 39 locations across the Site by JMA. The results and locations of those samples are contained in Appendix L.

#### B. DATA QUALITY OBJECTIVE AND APPROACH

This investigation was to obtain data of sufficient quality to screen the Site for VOC contamination to direct further investigations. The locations were chosen based upon known surface contamination; proximity to buildings, tanks, sewers, ponds, or burn pit; geophysics survey anomaly; or topographic low.

#### C. USABILITY CONCLUSIONS

It is concluded that this data should be used solely for site characterization as was originally intended.

\* \* \* \* \*

PART VI

SURFACE WATER DATA

A. MISSOURI DEPARTMENT OF NATURAL RESOURCES

1. EXISTING DATA

The existing data obtained by the MDNR consist of results from eighteen water sample analyses. The data are contained in Appendix G.

2. DATA QUALITY OBJECTIVE AND APPROACH

The objective of this sampling was to respond to a complaint received by the Missouri Water Pollution Control Program regarding suspected dumping of PCB materials by Rose. Data of sufficient quality was needed to determine if contamination existed and, if it did, to determine its source.

The MDNR took samples from the unnamed tributary to the south of the Site, the East and West branches of Pin Oak Creek, the South Fork Blackwater River, and nearby sanitary sewers. Samples were taken both upstream and downstream of the Site.

3. USABILITY CONCLUSIONS

Since these data were obtained in the fall of 1985 and the systems sampled are dynamic, it is concluded that these data are unusable due

to their lack of representativeness of current conditions. The data may provide historical insight into current conditions.

B. CHEMICAL WASTE MANAGEMENT, INC.

1. EXISTING DATA

The existing data obtained by CWM consist of results from ten water sample analyses. The data are contained in Appendix E.

2. DATA QUALITY OBJECTIVE AND APPROACH

The purpose this sampling was to obtain data of sufficient quality to characterize the PCB concentrations in on-site standing water. This was to include water standing in both the on-site ponds and in the two pits located in the Main Building.

3. USABILITY CONCLUSIONS

It is concluded that these data are unusable other than for historical insight. Since these samples were taken, unknown numbers of pond and pit volumes have displaced the volumes of water at these locations at the time of sampling. This displacement has been caused by natural rain events, pumping, or both.

\* \* \* \* \*

## PART VII

### GROUNDWATER DATA

#### A. EXISTING DATA

The existing groundwater data consist of one round of sampling both deep and shallow monitoring wells installed by JMA. The sampling was done by JMA, and the results are in Appendix M.

#### B. DATA QUALITY OBJECTIVE AND APPROACH

The objective of this sampling was to obtain data of sufficient quality to make a preliminary characterization of the groundwater contamination at the Site. The data were to be used to estimate remedial costs in support of the buy-out offer to smaller PRPs. One groundwater sample was obtained from each monitoring well and analyzed for PCBs, VOCs, and SVOCs.

#### C. USABILITY CONCLUSIONS

The data quality objective of this sampling event was achieved, and therefore the data should only be used for qualitative or semi-quantitative site characterization. The data quality precludes its used for any other RI/FS activities.

\* \* \* \* \*

## PART VIII

### AIR DATA

#### A. O. H. MATERIALS COMPANY

##### 1. EXISTING DATA

Existing air data consist of seven air samples and one blank taken during other sampling activities being carried out on-site. The results are in Appendix D.

##### 2. DATA QUALITY OBJECTIVE AND APPROACH

This sampling was carried out to obtain data of sufficient quality to assess the levels of protection necessary for on-site worker's protection. This was accomplished by placing samplers at several locations around the perimeter of the Site.

##### 3. USABILITY CONCLUSIONS

It is concluded that this data is unusable for RI/FS activities. This decision is based upon the fact that since cleanup of PCB waste materials has taken place, these sample results may not be representative of current (cleaner) conditions. The data may provide useful historical insight into current conditions.

B. CHEMICAL WASTE MANAGEMENT, INC.

1. EXISTING DATA

The existing data obtained by CWM consist of air samples taken during other on-site work activities being carried out by CWM. The data are in Appendix E.

2. DATA QUALITY OBJECTIVE AND APPROACH

This sampling was carried out to obtain data of sufficient quality to assess personal protective equipment requirements and any off-site migration of PCBs in the air because of on-site remedial activities. This was accomplished using a combination of personal sampling pumps on on-site workers, as well as by samplers placed at several locations around the Site perimeter.

3. USABILITY CONCLUSIONS

It is concluded that, although the data to provide useful historical insight, these data are unusable for RI/FS activities. This decision is based upon the fact that since cleanup of PCB waste materials has taken place, these sample results may not be representative of current (cleaner) conditions.

\* \* \* \* \*

PART IX  
ANIMAL TISSUE DATA

A. EXISTING DATA

The existing data on tissue sampling consist of analytical results from 12 composite samples of fish or frogs which were analyzed in early 1986 and 31 samples which were analyzed in mid-1986 for the Missouri Department of Conservation. The data and location maps are contained in Appendix N.

B. DATA QUALITY OBJECTIVE AND APPROACH

Little information concerning the sampling is available. These efforts appeared to be attempts to evaluate the effects of various potential PCB sources including Rose, the Amereco facility in Kingsville, and empty transformer carcasses found in Lazy Lake on concentrations of PCBs in water life in Pin Oak Creek and its tributaries.

For the earlier effort, it is known that all the samples submitted for analysis were whole fish or whole frog composites. Sample sizes varied from 1 to 12 fish of a particular type and from 1 to 2 frogs. As shown in Appendix N, samples were taken in the West Branch of Pin Oak Creek, in Pin Oak Creek, and a Pin Oak Creek tributary east of Holden. For the mid-1986 sampling whole fish or frog components were again analyzed except for one location (3) where some fillets were collected and analyzed. Sample sizes varied from 1 to 8. Sample locations were in various tributaries to West

Pin Oak Creek, East Pin Oak Creek, a Pin Oak Creek Tributary east of Holden, and in downstream portions of Pin Oak Creek.

C. USABILITY CONCLUSIONS

The data are not considered usable because of lack of representativeness. The data are from a dynamic environment and are more than three years old. During the first round, the only sample site (Number 105, see Appendix N) which was directly downstream of the Site is also downstream of the independent West Branch sample site (Number 106). Sample Site 106 should not have been affected by Rose and it showed PCB levels in frogs and fish similar to those at Sample Site 105. The second round Sample Site 7 is downstream of Rose Chemical in East Pin Oak Creek but is sufficiently close to West Pin Oak Creek that the fish could be affected by West Pin Oak Creek conditions. The data does provide some useful historical insight.

\* \* \* \* \*

**APPENDICES**

**APPENDIX A**

**ANALYTICAL METHODS USED  
BY LANGSTON LABORATORIES**

Langston Laboratories Inc.

Analysis of PCB's in Soil and Water

Soil and water samples are analyzed by gas chromatography, using an electron capture detector. The method used is a modification of method 8080, out of the EPA SW-846 manual. The GC column used is a 6' x 4mm i.d. glass column packed with 1.5% SP-2250 and 1.95% SP-2401 on 100/120 mesh Supelcoport. Standards of Aroclor 1221, 1232, 1242, 1254, and 1260 are injected onto the GC, and used for identification, and quantitation of the samples.

Soil samples are extracted by drying the soils overnight. The soils are then ground into a fine powder, and ten grams is weighed into a vial. Twenty mls. of hexanes is added to the vial, and this is shaken for an hour. The soils are then placed in an ultrasonic bath for thirty minutes. A portion of this extract is then acid washed as a cleanup step. The soils are then analyzed by gas chromatography.

Water samples are extracted by adding 400 mls. of the sample to an erlenmeyer flask. Ten mls. of hexanes is added to the flask, and the sample is shaken for one hour. The organic layer is pipeted off, and treated with sulfuric acid as a cleanup step. The water samples are then analyzed by gas chromatography.

Quality control is obtained by duplication of samples, spiking of samples, and analyzing blanks along with the samples. Ten percent of the samples are duplicated. Five percent of the samples are spiked. Blanks samples are made ,and analyzed with each set of sample extractions. Normally, spike recoveries of 40-120 percent recovery is considered acceptable. Duplication should be within fifteen percent difference. Blanks should be free of the analytes, and of sample interferences. If any of these criteria is not met, the questionable samples should be reanalyzed.

### GC/MS ANALYSIS

#### Volatiles

A Finnigan 5100 GC/MS system (San Jose, CA) was used for volatiles analyses. The purge-trap instrument was a Tekmar (Cincinnati, OH) LSC-2 and ALS for automated sample analysis. The method used was a modification of Method 8240, found in EPA SW-846.

The GC column obtained from Supelco (Cat. No. 1-1815) was packed with Carbo pack B (1% SP-1000) on Supelcort (80/100 mesh). Analytical standards were also supplied by Supelco (Bellefonte, PA).

The soil extraction method followed U. S. EPA protocols for medium level soil extracts. A portion of soil (5 gram) was weighed in a tared bottle, ten milliliters (10 mL) of methanol added, allowing the mixture to shake vigorously for five minutes at room temperature. A 100  $\mu$ l volume of methanol was then added with standards to 5 mL of blank water. The internal standard method of quantitation was used.

Duplicate sample analyses, reagent blanks and individual sample spikes were provided for QA/QC profile checks.

#### Semi-Volatiles

The method used was a modification of Method 8270, out of EPA SW-846.

A Finnigan 5100 GC/MS system (San Jose, CA) complete with a DB-5 capillary column (60 m X .032 mm ID, 1  $\mu$  film thickness, J & W Scientific) was used for the Base Neutral Acid analyses.

The internal standard method of quantitation was used in combination with analytical standards supplied through Supelco (Bellefonte, PA).

QA/QC sample checks, selected spike recoveries and duplicate sample analyses were examined closely. The U.S. EPA CLP Organic protocols were used.

Langston Laboratories Inc.

PCB Air Analysis

The method used for this analysis was NIOSH method 5503. PCB's in air are trapped on a tube containing florisil. These tubes are divided into a front, and a back section. The front section is divided and placed into a test tube. The back section is placed into a separate test tube, and five mls. of toluene is added to both test tubes. the toluene desorbs the PCB's from the florisil. The samples are desorbed for thirty minutes with occassional shaking of the test tubes. A portion of the toluene is then taken for GC analysis.

The toluene extract is analyzed by gas chromatography, using an electron capture detector. The GC column used is a 6' x 4mm i.d. glass column packed with 1.5% SF-2250 and 1.95% SF-2401 on 100/120 Supelcoport. Standards of Aroclor 1221, 1232, 1242, 1248, 1254, and 1260 are injected onto the GC, and used for identification, and for quantitation of the samples. Three levels of each Aroclor standard is analyzed, and used for standard calibration, and standard linearity.

Quantitation of PCB's in the samples was performed by adding the PCB's found in the front section with the amount of PCB's found in the back section. The reported values were the total micrograms of PCB's found in the florisil tube.

**APPENDIX B**

**QA/QC DATA PROVIDED BY  
LANGSTON LABORATORIES**



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

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2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

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February 17, 1989

Steve Kidwell  
Burns & McDonnell  
P.O. Box 419173  
Kansas City, MO 64141

Dear Steve:

Enclosed is the QC summary that you requested. All of the previous reports were found, and all the pertinent QC information was collected. I have included duplicates, spikes, and surrogate recoveries.

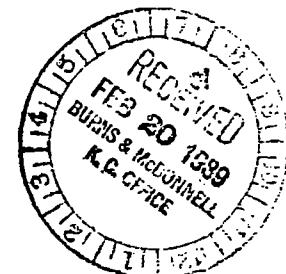
If you have any questions, please feel free to contact me.

Yours truly,

*Marsha L. Carroll*

Marsha L. Carroll  
QA/QC Officer

Enclosure



LANGSTON LABORATORIES, INC.  
 QC PRECISION STATEMENT FOR BURNS & MCDONNELL  
 DUPLICATES 2/17/89  
 AROCLOR 1260 IN SOIL UNITS MG/KG

Client	CLIENT ID	LLI ID	Date	Analyses	VALUE1	VALUE2	%DIFF.	Reference
JOHN MATHEIS	BS-5	280804	07/16/87	227.00	214.00	6	1176/137	
CHEMICAL WASTE MANAGEMENT	QUAD #208	2004	04/14/87	0.75	0.75	0	1169/93	
CHEMICAL WASTE MANAGEMENT	#39B	198139B	04/10/87	1.90	2.30	19	1169/85	
CHEMICAL WASTE MANAGEMENT	#39D	198139D	04/10/87	4.60	6.50	34	1169/85	
CHEMICAL WASTE MANAGEMENT	#40A	198140A	04/10/87	2.50	3.00	18	1169/85	
CHEMICAL WASTE MANAGEMENT	#44B	198144B	04/10/87	3.90	5.10	27	1169/85	
CHEMICAL WASTE MANAGEMENT	#105C	1981105C	04/10/87	2.50	2.50	0	1169/85	
CHEMICAL WASTE MANAGEMENT	#20B	198120B	04/10/87	2.10	2.40	13	1169/85	
CHEMICAL WASTE MANAGEMENT	97A	175549	04/03/87	1.70	1.20	34	1169/12	
CHEMICAL WASTE MANAGEMENT	66A	175557	04/03/87	13.80	12.80	8	1169/12	
CHEMICAL WASTE MANAGEMENT	59D	175516	04/03/87	3.50	3.00	15	1169/12	
CHEMICAL WASTE MANAGEMENT	PIT-069-4	175571	04/03/87	2.60	2.10	21	1169/12	
CHEMICAL WASTE MANAGEMENT	PO-03 #10 MID SE	175586	04/03/87	3.90	3.50	11	1169/12	
CHEMICAL WASTE MANAGEMENT	55D	175504	04/03/87	93.90	99.30	6	1169/12	
CHEMICAL WASTE MANAGEMENT	48C	175519	04/03/87	0.66	1.80	93	1169/12	
CHEMICAL WASTE MANAGEMENT	PO-04 #6 MID NW	175594	04/03/87	1.30	1.30	0	1169/12	
CHEMICAL WASTE MANAGEMENT	#74	140274	02/19/87	0.44	0.48	9	1154/423	
CHEMICAL WASTE MANAGEMENT	#111	1402111	02/16/87	0.94	1.20	24	1154/421	
CHEMICAL WASTE MANAGEMENT	#46	140246	02/06/87	2.20	2.10	5	1154/411	
CHEMICAL WASTE MANAGEMENT	QUAD #26	0801	11/17/86	8.70	5.30	49	1154/212	
CHEMICAL WASTE MANAGEMENT	QUAD #43	0801	11/17/86	4.30	3.20	29	1154/212	
CHEMICAL WASTE MANAGEMENT	QUAD #24	0761	11/05/86	7.20	7.00	3	1154/184	
CHEMICAL WASTE MANAGEMENT	QUAD #8	0761	11/05/86	0.95	1.10	15	1154/184	
CHEMICAL WASTE MANAGEMENT	QUAD #16	0761	11/05/86	3.10	2.70	14	1154/184	
CHEMICAL WASTE MANAGEMENT	QUAD #1	0622	10/21/86	2.10	2.50	17	1154/144	
CHEMICAL WASTE MANAGEMENT	QUAD #6	0622	10/21/86	21.10	20.60	2	1154/144	
OH MATERIALS	#74	028074	09/15/86	1.70	1.70	0	1154/046	
OH MATERIALS	#78	028078	09/15/86	8.30	8.00	4	1154/046	
OH MATERIALS	#81	028081	09/15/86	1.90	1.90	0	1154/046	
OH MATERIALS	#82	028082	09/15/86	1.90	1.90	0	1154/046	
OH MATERIALS	3 1ST	023103	09/13/86	1.10	1.10	0	1154/28	
OH MATERIALS	10 2ND	023110	09/13/86	2.70	2.80	4	1154/28	
OH MATERIALS	21	023121	09/13/86	3.10	3.10	0	1154/28	
OH MATERIALS	26 SOIL	024526	09/09/86	0.60	0.61	2	1154/030	

LANGSTON LABORATORIES, INC.  
 QC PRECISION STATEMENT FOR BURNS & MCDONNELL  
 DUPLICATES 2/17/89  
 AROCLOR 1242      IN SOIL UNITS MG/KG

Client	CLIENT ID	LLI ID	Date	Analyses	VALUE1	VALUE2	%DIFF	Reference
JOHN MATHES	SWH 10-2	355607	09/09/87	0.10	0.10	0	1176/314	
JOHN MATHES	NWH 7-2 2-3.5'	351803	09/09/87	0.10	0.10	0	1176/308	
JOHN MATHES	NWH 6-1 .5-2'	351701	09/09/87	1.20	1.20	0	1176/308	
JOHN MATHES	NWH 2-2	3507	09/08/87	0.10	0.10	0	1176/314	
JOHN MATHES	NWH 1-1D .5-2'	351604	09/08/87	0.10	0.10	0	1176/308	
JOHN MATHES	BS-5	280804	07/16/87	76.00	68.00	11	1176/137	
JOHN MATHES	SB 8-1D	276002	07/02/87	0.10	0.10	0	1176/130	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
JOHN MATHES	SB 7-2	274409	06/26/87	0.10	0.10	0	1176/120	
CHEMICAL WASTE MANAGEMENT	JM TB2 1D	266902	06/19/87	0.10	0.10	0	1176/100	
JOHN MATHES	JM TB3 1D	2610003	06/19/87	0.10	0.10	0	1176/100	
CHEMICAL WASTE MANAGEMENT	JM SB 5-2	263607	06/19/87	0.10	0.10	0	1176/100	
JOHN MATHES	SB13-1D	267910	06/16/87	0.10	0.10	0	1176/100	
JOHN MATHES	SB 5-2	2636	06/15/87	0.10	0.10	0	1176/100	
JOHN MATHES	TB2-1D	266902	06/15/87	0.10	0.10	0	1176/100	
JOHN MATHES	TB 3-1D	2610	06/09/87	0.10	0.10	0	1176/100	
CHEMICAL WASTE MANAGEMENT	Q-054-R0511	231401	05/11/87	0.10	0.10	0	1176/19	
CHEMICAL WASTE MANAGEMENT	QUAD #208	2004	04/14/87	0.35	0.31	12	1169/93	
CHEMICAL WASTE MANAGEMENT	#44B	198144B	04/10/87	2.60	3.70	35	1169/85	
CHEMICAL WASTE MANAGEMENT	#20B	198120B	04/10/87	0.71	0.65	9	1169/85	
CHEMICAL WASTE MANAGEMENT	#105C	1981105C	04/10/87	0.50	0.52	4	1169/85	
CHEMICAL WASTE MANAGEMENT	#39D	198139D	04/10/87	2.70	3.10	14	1169/85	
CHEMICAL WASTE MANAGEMENT	#39B	198139B	04/10/87	0.51	0.54	6	1169/85	
CHEMICAL WASTE MANAGEMENT	#40A	198140A	04/10/87	2.40	2.30	4	1169/85	
CHEMICAL WASTE MANAGEMENT	97A	175549	04/03/87	0.62	0.46	30	1169/12	
CHEMICAL WASTE MANAGEMENT	55D	175504	04/03/87	13.50	13.90	3	1169/12	
CHEMICAL WASTE MANAGEMENT	66A	175557	04/03/87	10.00	9.40	6	1169/12	
CHEMICAL WASTE MANAGEMENT	PIT-069-4	175571	04/03/87	1.30	1.40	7	1169/12	
CHEMICAL WASTE MANAGEMENT	PO-03 #10 MID SE	175586	04/03/87	1.30	1.00	26	1169/12	
CHEMICAL WASTE MANAGEMENT	PO-05 #28	1755100	04/03/87	0.10	0.10	0	1169/12	
CHEMICAL WASTE MANAGEMENT	48C	175519	04/03/87	0.52	0.95	59	1169/12	
CHEMICAL WASTE MANAGEMENT	59D	175516	04/03/87	4.10	3.40	19	1169/12	
CHEMICAL WASTE MANAGEMENT	#202	164810	03/06/87	0.10	0.10	0	1154/479	
CHEMICAL WASTE MANAGEMENT	#181	1585181	02/26/87	8.30	7.10	16	1154/463	
CHEMICAL WASTE MANAGEMENT	STORM DRAIN WEST	1585WEST	02/26/87	1.30	1.40	7	1154/463	
CHEMICAL WASTE MANAGEMENT	#174	1585174	02/26/87	0.10	0.10	0	1154/463	
CHEMICAL WASTE MANAGEMENT	#181	1585181	02/26/87	15.00	13.40	11	1154/463	
CHEMICAL WASTE MANAGEMENT	#74	140274	02/19/87	0.20	0.22	10	1154/423	
CHEMICAL WASTE MANAGEMENT	#125	1402125	02/19/87	0.10	0.10	0	1154/442	
CHEMICAL WASTE MANAGEMENT	#92	140292	02/19/87	0.10	0.10	0	1154/442	
CHEMICAL WASTE MANAGEMENT	#111	1402111	02/16/87	0.21	0.62	99	1154/421	
CHEMICAL WASTE MANAGEMENT	#109	1402109	02/16/87	0.10	0.10	0	1154/421	
CHEMICAL WASTE MANAGEMENT	#154	1402154	02/13/87	0.10	0.10	0	1154/419	
CHEMICAL WASTE MANAGEMENT	#143	1402143	02/13/87	0.10	0.10	0	1154/419	

LANGSTON LABORATORIES, INC.  
 QC PRECISION STATEMENT FOR BURNS & MCDONNELL  
 DUPLICATES 2/17/89

CHEMICAL WASTE MANAGEMENT	#141	1402141	02/13/87	0.10	0.10	0	1154/419
CHEMICAL WASTE MANAGEMENT	#100	1402100	02/13/87	0.10	0.10	0	1154/419
CHEMICAL WASTE MANAGEMENT	#129	1402129	02/13/87	0.10	0.10	0	1154/419
CHEMICAL WASTE MANAGEMENT	#63	140263	02/06/87	0.10	0.10	0	1154/411
CHEMICAL WASTE MANAGEMENT	#46	140246	02/06/87	1.40	1.40	0	1154/411
CHEMICAL WASTE MANAGEMENT	QUAD #43	0801	11/17/86	1.40	1.30	7	1154/212
CHEMICAL WASTE MANAGEMENT	QUAD #26	0801	11/17/86	11.60	10.00	15	1154/212
CHEMICAL WASTE MANAGEMENT	QUAD #8	0761	11/05/86	0.33	0.51	43	1154/184
CHEMICAL WASTE MANAGEMENT	QUAD #24	0761	11/05/86	3.00	3.20	6	1154/184
CHEMICAL WASTE MANAGEMENT	QUAD #16	0761	11/05/86	1.06	1.10	4	1154/184
CHEMICAL WASTE MANAGEMENT	QUAD #6	0622	10/21/86	1.90	2.10	10	1154/144
OH MATERIALS	#82	028082	09/15/86	0.21	0.62	99	1154/046
OH MATERIALS	#78	028078	09/15/86	1.40	1.50	7	1154/046
OH MATERIALS	#81	028081	09/15/86	0.61	0.59	3	1154/046
OH MATERIALS	#74	028074	09/15/86	0.30	0.50	50	1154/046
OH MATERIALS	21	023121	09/13/86	0.70	0.70	0	1154/28
OH MATERIALS	3 1ST	023103	09/13/86	1.10	1.00	10	1154/28
OH MATERIALS	10 2ND	023110	09/13/86	4.00	3.90	3	1154/28
OH MATERIALS	16	023116	09/13/86	0.10	0.10	0	1154/28
OH MATERIALS	26 SOIL	024526	09/09/86	0.46	0.42	9	1154/030
OH MATERIALS	58 SOIL	024558	09/09/86	0.10	0.10	0	1154/032

LANGSTON LABORATORIES, INC.  
QC ACCURACY STATEMENT FOR  
SPIKING PCB'S IN SOIL

FEBRUARY 17, 1989

AROCLOL 1242

CLIENT	CLIENT ID	LLI ID	DATE OF ANALYSIS	% RECOV.	REFERENCE
CHEMICAL WASTE MANAGEMENT	#168	1402168	02/20/87	93.0	1154/452
CHEMICAL WASTE MANAGEMENT	#126	1402126	02/20/87	73.0	1154/452
CHEMICAL WASTE MANAGEMENT	#148	1402148	02/20/87	93.0	1154/452
CHEMICAL WASTE MANAGEMENT	#109	1402109	02/20/87	76.0	1154/452
CHEMICAL WASTE MANAGEMENT	QUAD #26	0801	11/17/86	100.0	1154/213
CHEMICAL WASTE MANAGEMENT	QUAD #38	0801	11/17/86	121.0	1154/213
CHEMICAL WASTE MANAGEMENT	QUAD #34	0801	11/17/86	108.0	1154/214
CHEMICAL WASTE MANAGEMENT	QUAD #6	0622	10/21/86	179.0	1154/145
CHEMICAL WASTE MANAGEMENT	QUAD #1	0622	10/21/86	148.0	1154/145
OH MATERIALS	#26	0245	09/22/86	110.0	1154/111
OH MATERIALS	#69 0'-1'	0280	09/22/86	84.0	1154/111
OH MATERIALS	#85	0280	09/22/86	114.0	1154/111
OH MATERIALS	#19	0231	09/22/86	93.0	1154/111
OH MATERIALS	#46	0245	09/22/86	100.0	1154/111
OH MATERIALS	#52	0243	09/22/86	111.0	1154/111
OH MATERIALS	#56	0245	09/22/86	94.0	1154/111
OH MATERIALS	#74	0280	09/15/86	98.0	1154/58
OH MATERIALS	#74	0280	09/15/86	106.0	1154/58
OH MATERIALS	#12	0231	09/15/86	92.0	1154/63
OH MATERIALS	#82	0280	09/15/86	104.0	1154/58
OH MATERIALS	#79	0280	09/15/86	86.0	1154/58
OH MATERIALS	#75	0280	09/15/86	92.0	1154/58
OH MATERIALS	#74	0280	09/15/86	97.0	1154/58

AROCLOL 1260

CLIENT	CLIENT ID	LLI ID	DATE OF ANALYSIS	% RECOV.	REFERENCE
CHEMICAL WASTE MANAGEMENT	#106	1402106	02/20/87	99.0	1154/452
CHEMICAL WASTE MANAGEMENT	#73	140273	02/20/87	78.0	1154/452
CHEMICAL WASTE MANAGEMENT	QUAD #34	0801	11/17/86	116.0	1154/214
CHEMICAL WASTE MANAGEMENT	QUAD #26	0801	11/17/86	131.0	1154/213
CHEMICAL WASTE MANAGEMENT	QUAD #38	0801	11/17/86	140.0	1154/213
CHEMICAL WASTE MANAGEMENT	QUAD #4	0761	11/10/86	94.0	1154/193
CHEMICAL WASTE MANAGEMENT	QUAD #6	0622	10/21/86	91.0	1154/145
CHEMICAL WASTE MANAGEMENT	QUAD #1	0622	10/21/86	119.0	1154/145
OH MATERIALS	#74	0280	09/15/86	105.0	1154/58
OH MATERIALS	#79	0280	09/15/86	116.0	1154/58
OH MATERIALS	#75	0280	09/15/86	98.0	1154/58
OH MATERIALS	#74	0280	09/15/86	93.0	1154/58
OH MATERIALS	#74	0280	09/15/86	100.0	1154/58

AROCLOL 1254

CLIENT	CLIENT ID	LLI ID	DATE OF ANALYSIS	% RECOV.	REFERENCE
CHEMICAL WASTE MANAGEMENT	#87	140287	02/20/87	66.0	1154/452
CHEMICAL WASTE MANAGEMENT	QUAD #2	0761	11/10/86	93.0	1154/193

LANGSTON LABORATORIES, INC.  
QC ACCURACY STATEMENT  
SURROGATE RECOVERIES IN SOILS  
VOLATILE ORGANICS

February 17, 1989

CLIENT JOHN MATHES

CLIENT ID	LLI ID	DATE OF ANALYSIS	% SURROGATE RECOVERIES		
			SS1	SS2	SS3
SS #1	355704	09/04/87	118	89	92
SS #5	355705	09/04/87	116	90	94
SS #6	355706	09/04/87	75	84	84
SWH 11-1 .5-2'	355601	09/04/87	56	85	83
SWH 11-1D .5-2'	355602	09/04/87	58	87	82
SWH 11-2 2-3.5'	355603	09/04/87	100	91	93
SS #4	355701	09/04/87	113	90	91
SS #3	355702	09/04/87	113	91	89
SS #2	355703	09/04/87	113	88	98
SWH 10-2 2-3.5'	355607	09/04/87	111	89	95
SWH 10-1D 0.5-2'	355606	09/04/87	111	89	94
SWH 10-1 0.5-2'	355605	09/04/87	106	90	90
NWH 3-2 2-3.5'	352503	08/31/87	114	97	90
NWH 3-1D .5-2'	352502	08/31/87	111	98	90
NWH 3-1 .5-2'	352501	08/31/87	93	96	96
NWH 7-1D .5-2'	351802	08/30/87	78	88	85
NWH 7-1 .5-2'	351801	08/30/87	78	86	85
NWH 6-2 2-3.5'	351703	08/30/87	78	89	83
NWH 6-1D .5-2'	351702	08/30/87	78	89	83
NWH 6-1 .5-2'	351701	08/30/87	77	88	85
NWH 1-1D .5-2'	351604	08/30/87	77	87	82
NWH 1-2 2-3.5'	351602	08/30/87	78	85	83
NWH 1-1 .5-2'	351601	08/30/87	77	86	86
NWH 7-2 2-3.5'	351803	08/30/87	78	87	83
NWH 2-1 .5-2'	350709	08/29/87	105	87	80
NWH 2-2 2-3.5'	350711	08/29/87	105	89	81
NWH 5-2 2-3.5'	350703	08/29/87	104	85	77
NWH 2-1D .5-2'	350710	08/29/87	104	89	83
NWH 2-1D .5-2'	350710 DUP	08/29/87	98	99	97
NWH 5-1D .5-2'	350702	08/29/87	101	88	80
NWH 5-1 .5-2'	350701	08/29/87	100	90	79
NWH 4-1D .5-2'	348705	08/27/87	123	88	85
NWH 8-2	346903	08/27/87	109	88	85
NWH 8-1	346901	08/27/87	82	91	89
NWH 8-1D	346902	08/27/87	91	92	87
NWH 9-2 2-3.5'	348703	08/27/87	94	85	84
NWH 4-1 .5-2'	348704	08/27/87	122	90	91
NWH 9-1D .5-2'	348702	08/27/87	90	88	85
NWH 4-2 2-3.5'	348706	08/27/87	129	86	75
NWH 9-1 .5-2'	348701	08/27/87	87	90	86
BS-3	280802	06/30/87	76	90	90
BS-5	280804	06/30/87	79	86	93
BS-7	280806	06/30/87	82	94	91
BS-2A	280801	06/30/87	71	84	86
BS-6	280805	06/30/87	86	94	80
BS-4	280803	06/30/87	81	92	83
BS-8	280807	06/29/87	83	114	90
SB18-1	276004	06/28/87	75	89	101
SB6-1	276006	06/28/87	78	89	102
SB12-2	276010	06/28/87	78	86	101

LANGSTON LABORATORIES, INC.  
QC ACCURACY STATEMENT

SURROGATE RECOVERIES IN SOILS

February 17, 1989

SB18-2	276005	06/28/87	76	84	95
SB12-1	276010	06/28/87	81	90	97
SB6-2	276007	06/28/87	79	88	93
SB11-1	276008	06/28/87	84	93	89
SB11-2	276009	06/28/87	82	93	93
SB8-1	276001	06/27/87	100	106	112
SB23-1D	274402 DUP	06/27/87	97	104	114
SB23-2	274403 DUP	06/27/87	95	109	116
SB23-2	274403	06/26/87	110	116	114
SB23-1D	274402	06/26/87	111	113	114
SB16-1	274406	06/26/87	97	104	111
SB23-1	274401	06/26/87	114	110	114
SB7-1	274408	06/26/87	100	97	110
SB7-2	274409	06/26/87	99	113	110
SB16-2	274407	06/26/87	102	98	99
SB15-1	274404	06/26/87	114	119	113
SB15-2	274405	06/26/87	99	103	110
SB13-1	267909	06/19/87	77	133	136
SB13-1D	267910	06/19/87	79	134	138
SB13-2	267911	06/19/87	77	133	135
SB1-1	267905	06/19/87	78	132	137
SB1-2	267906	06/19/87	77	134	137
SB24-1	267907	06/19/87	79	135	135
SB24-2	267908	06/19/87	76	138	131
SB2-2	267904	06/19/87	75	127	130
SB3-1	267901	06/19/87	76	129	127
SB3-2	267902	06/19/87	75	129	128
SB2-1	267903	06/19/87	76	129	132
SB 14-1	270801	06/18/87	92	129	127
SB 19-1	270805	06/18/87	90	132	129
SB 19-1D	270806	06/18/87	89	133	126
SB 19-2	270807	06/18/87	88	129	124
SB 21-1	270808	06/18/87	87	128	123
SB 21-2	270809	06/18/87	90	129	129
SB 14-2	270802	06/18/87	89	131	124
SB 22-1	270803	06/18/87	88	133	127
SB 22-2	270804	06/18/87	90	132	127
JM SB10 1	266908	06/16/87	88	90	104
JM SB10 2	266908	06/16/87	88	91	104
JM TB2 5	266905	06/16/87	95	95	105
JM TB2 1	266901	06/16/87	89	91	102
JM TB2 1D	266902	06/16/87	90	91	102
JM TB2 4	266904	06/16/87	93	94	104
JM SB9 2	266907	06/16/87	89	89	102
JM SB9 1	266906	06/16/87	89	91	101
JM TB2 2	266903	06/16/87	92	93	103
JM TB3-2	261002	06/15/87	86	95	103
JM TB3-1	261001	06/15/87	85	94	99
JM TB3-3 1D	261003	06/15/87	86	95	98
JM TB-1 2	263603	06/13/87	92	107	108
JM SB4 2	263605	06/13/87	89	105	107
JM SB5 1	263606	06/13/87	88	95	99
JM SB5 2	263607	06/13/87	86	96	100
JM SB4 1	263604	06/13/87	90	107	108
JM TB-1 1	263601	06/12/87	82	95	99
JM TB-1 1D	263602	06/12/87	82	96	96

CLIENT JOHN MATHEIS

LANGSTON LABORATORIES, INC.  
QC ACCURACY STATEMENT  
SURROGATE RECOVERIES IN WATER  
VOLATILE ORGANICS

February 17, 1989

CLIENT ID	LLI ID	DATE OF ANALYSIS	% SURROGATE RECOVERIES		
			SS1	SS2	SS3
MW 201	350718	08/31/87	92	97	95
TRIP BLANK	350719	08/29/87	98	90	86
MW 152	288304	07/09/87	105	115	108
MW 102	288302	07/09/87	94	113	109
MW 103	288303	07/09/87	93	125	128
MW 101	288301	07/09/87	88	133	129
BLANK	283704	07/02/87	87	72	107
MW 203	283702	07/02/87	91	83	101
MW 252	283703	07/02/87	89	77	101
MW 202	283701	07/02/87	89	72	104
	261002	06/15/87	86	95	103
	261003	06/15/87	86	95	98
	261001	06/15/87	85	94	99

SS1 = 1,2 DICHLOROETHANE D4

SS2 = TOLUENE D8

SS3 = BROMOFLUOROBENZENE

CLIENT JOHN MATHES

LANGSTON LABORATORIES, INC.  
QC ACCURACY STATEMENT  
SURROGATE RECOVERIES IN SOIL  
SEMIVOLATILE ORGANICS

February 17, 1989

DATE OF ANALYSIS 9/12/87

% SURROGATE RECOVERIES

CLIENT ID	LLI ID	SS1	SS2	SS3	SS4	SS5	SS6
NWH 5-2	365801	0.0	0.0	91.4	58.4	24.4	81.4
SWH 11-2	365802	140.4	156.0	0.0	51.0	90.2	103.6
SS-5	365803	17.4	17.8	0.0	5.2	11.0	9.8

SS1 - 2-FLUOROPHENOL  
SS2 - PHENOL-D6  
SS3 - 2,4,6-TRIBROMOPHENOL  
SS4 - NITROBENZENE-D5  
SS5 - 2-FLUOROBIPHENYL  
SS6 - TERPHENYL-D14

NOTE: SAMPLES HAD TO HAVE A 1/10 DILUTION DUE TO MATRIX INTERERENCES.

PACE LABORATORIES KANSAS CITY REGION  
FOR BURNS & MCDONNELL  
CALIBRATION DATA FOR PCB PROJECT

August 8, 1989

PROJECT	STD CONC (PPB)	AROCLCR PEAK HEIGHT		
		1242	1254	1260
86-0622	100	1.39		
	500	7.85		
	500			1.73
	750	18.11		
	250			0.95
	250		0.93	
	500	8.31		2.07
	1000		3.09	
	750	18.93		
	250		1.12	
86-0761	500	8.40		2.09
	250			1.05
	500	500.00		500.00
	500		362.00	
	750	793.00		
	250	242.00		199.00
	250			
	500	570.00		468.00
	500		358.00	
	100			106.00
100	500	514.00		466.00
	500		306.00	
	1000			868.00
	100	115.00		
	500	540.00		446.00
	1000		642.00	
	250	254.00		
	250			210.00
	100	116.00		
	500	532.00		515.00
500			348.00	

PACE LABORATORIES KANSAS CITY REGION  
 FOR BURNS & MCDONNELL  
 CALIBRATION DATA FOR PCB PROJECT

August 8, 1989

PROJECT	STD CONC (PPB)	AROCLOL PEAK HEIGHT		
		1242	1254	1260
86-0801	500	522.00		531.00
	500		409.00	
	250	273.00		
	100	134.00		
	250		226.00	
	1000			1268.00
	500	575.00		751.00
	500		500.00	
	500	647.00		735.00
	500		519.00	
87-1402	500	48.50		
	500		52.00	
	500			59.00
	250	26.50		
	1000			113.00
	500	49.00		
	200		21.50	
	500			49.50
	500		52.50	
	750			108.50
500	47.00			
	500			58.00
	500			69.00
	250	27.50		
500	45.00			
	1000		90.00	

PACE LABORATORIES KANSAS CITY REGION  
FOR BURNS & MCDONNELL  
CALIBRATION DATA FOR PCB PROJECT

August 8. 1989

PROJECT	STD CONC (PPB)	1242	AROCOLOR PEAK HEIGHT	
			1254	1260
87-1585	500		47.00	
	500			56.00
	250	30.50		
	200		20.00	
	500	28.50		
	500	28.50	42.50	
	500			54.50
	250	29.50		
	500	27.50		
	500		42.50	
	250	28.00		
	500	30.00		
	200		18.00	
	500		41.50	
	500			54.50
	1000			100.00
	500	32.50		
	200	13.00		
	500			45.00
	250	20.00		
	500		32.00	
	500			47.50
	500	34.00		
	200		13.00	
	500	34.00		
	1000			95.50

PACE LABORATORIES KANSAS CITY REGION  
FOR BURNS & MCDONNELL  
CALIBRATION DATA FOR PCB PROJECT

August 8, 1989

PROJECT	STD CONC (PPB)	AROCLOR PEAK HEIGHT		
		1242	1254	1260
87-1648	500	27.50		
	500		23.50	
	500			37.50
	250	10.00		
	200		9.50	
	500	30.50		
	200		10.00	
	1000			82.50
	250	19.50		
	500		25.00	
87-1755	500	29.00		
	500		25.50	
	500			34.00
	500	37.00		
	500		23.00	
	500			29.00
	250	17.00		
	200		8.50	
	500	27.00		
	1000			63.50
	500	26.50		
	500		21.50	
	100			5.50
	250	16.50		
	200		8.00	
	500	25.50		
	1000		39.50	

PACE LABORATORIES KANSAS CITY REGION  
 FOR BURNS & MCDONNELL  
 CALIBRATION DATA FOR PCB PROJECT

August 8, 1989

PROJECT	STD CONC (PPB)	AROCLOL PEAK HEIGHT		
		1242	1254	1260
87-1981	500	47.50		
	500		43.50	
	500			48.00
	250	27.00		
	200		22.50	
	500	50.50		
	500		43.50	
	500			48.50
	500		61.50	
	500			64.50
	250	34.00		
	200	24.50		
	1000		104.50	
	200			29.00
	250	33.50		
	1000			124.00
	500	61.00		
	500			63.50
87-2004	100	16.50		
	200		24.00	
	200			27.00
	500			64.00
	500			64.00
87-2252	500	47.50		
	500		42.00	
	500			45.50
	250	25.00		
	200		18.50	
87-2314	500			50.50
	250	26.00		

BURNS & MCDONNELL  
 PCB PROJECT CHEM WASTE MANAGEMENT  
 AUGUST 7, 1989

PROJECT #	DATE RECEIVED	DATE ANALYZED	PROJ#	SID	1242	AROCHOR		
						1254	1260	Spiking Concentrations (mg/kg)
86-0622	10/16/86	10/20/86	0622	Q-1	4.02	---	2.01	
			0622	Q-6	3.93	---	19.60	
86-0761	11/05/86	11/06/86	0761	Q-2	---	1.95	---	
			0761	Q-4	---	---	2.98	
			0761	Q-11	---	---	1.97	
86-0801	11/12/86	11/17/86	0601	26	10.00	---	5.30	
			0801	34	8.60	---	6.60	
			0801	38	0.20	---	1.20	
87-1402	02/02/87	02/06/87	1402	73	---	---	1.80	
			1402	87	---	---	0.97	
			1402	106	---	---	0.95	
			1402	109	---	---	1.97	
			1402	126	---	---	1.01	
			1402	148	---	---	0.89	
			1402	168	---	---	9.80	
87-1585	02/24/87	03/06/87						
87-1648	03/03/87	03/06/87						
87-1755	03/12/87	03/20/87						
87-1981	04/09/87	04/10/87						
87-2004	04/10/87	04/14/87						
87-2252	05/04/87	05/06/87						
87-2314	05/11/87	05/12/87						

**APPENDIX C**

**QA/QC ACCEPTANCE  
CRITERIA TABLES**

TABLE 3. QC ACCEPTANCE CRITERIA<sup>a</sup>

Parameter	Test conc. (ug/L)	Limit for s (ug/L)	Range for X (ug/L)	Range P, Ps (%)
Aldrin	2.0	0.42	1.08-2.24	42-122
$\alpha$ -BHC	2.0	0.48	.98-2.44	37-134
$\beta$ -BHC	2.0	0.64	0.78-2.60	17-147
$\delta$ -BHC	2.0	0.72	1.01-2.37	19-140
$\gamma$ -BHC	2.0	0.46	0.86-2.32	32-127
Chlordane	50	10.0	27.6-54.3	45-119
4,4'-DDD	10	2.8	4.8-12.6	31-141
4,4'-DDE	2.0	0.55	1.08-2.60	30-145
4,4'-DDT	10	3.6	4.6-13.7	25-160
Dieldrin	2.0	0.76	1.15-2.49	36-146
Endosulfan I	2.0	0.49	1.14-2.82	45-153
Endosulfan II	10	6.1	2.2-17.1	D-202
Endosulfan Sulfate	10	2.7	3.8-13.2	26-144
Endrin	10	3.7	5.1-12.6	30-147
Heptachlor	2.0	0.40	0.86-2.00	34-111
Heptachlor epoxide	2.0	0.41	1.13-2.63	37-142
Toxaphene	50	12.7	27.8-55.6	41-126
PCB-1016	50	10.0	30.5-51.5	50-114
PCB-1221	50	24.4	22.1-75.2	15-178
PCB-1232	50	17.9	14.0-98.5	10-215
PCB-1242	50	12.2	24.8-69.6	39-150
PCB-1248	50	15.9	29.0-70.2	38-158
PCB-1254	50	13.8	22.2-57.9	29-131
PCB-1260	50	10.4	18.7-54.9	8-127

s = Standard deviation of four recovery measurements, in ug/L.

X = Average recovery for four recovery measurements, in ug/L.

P, Ps = Percent recovery measured.

D = Detected; result must be greater than zero.

<sup>a</sup>Criteria from 40 CFR Part 136 for Method 608. These criteria are based directly upon the method performance data in Table 4. Where necessary, the limits for recovery have been broadened to assure applicability of the limits to concentrations below those used to develop Table 4.

TABLE 4. METHOD ACCURACY AND PRECISION AS FUNCTIONS OF CONCENTRATION<sup>a</sup>

Parameter	Accuracy, as recovery, $x'$ (ug/L)	Single analyst precision, $s_{r'}$ (ug/L)	Overall precision, $S'$ (ug/L)
Aldrin	0.81C+0.04	0.16X-0.04	0.20X-0.01
$\alpha$ -BHC	0.84C+0.03	0.13X+0.04	0.23X-0.00
$\beta$ -BHC	0.81C+0.07	0.22X+0.02	0.33X-0.95
$\delta$ -BHC	0.81C+0.07	0.18X+0.09	0.25X+0.03
$\gamma$ -BHC	0.82C-0.05	0.12X+0.06	0.22X+0.04
Chlordane	0.82C-0.04	0.13X+0.13	0.18X+0.18
4,4'-DDD	0.84C+0.30	0.20X-0.18	0.27X-0.14
4,4'-DDE	0.85C+0.14	0.13X+0.06	0.28X-0.09
4,4'-DDT	0.93C-0.13	0.17X+0.39	0.31X-0.21
Dieldrin	0.90C+0.02	0.12X+0.19	0.16X+0.16
Endosulfan I	0.97C+0.04	0.10X+0.07	0.18X+0.08
Endosulfan II	0.93C+0.34	0.41X-0.65	0.47X-0.20
Endosulfan Sulfate	0.89C-0.37	0.13X+0.33	0.24X+0.35
Endrin	0.89C-0.04	0.20X+0.25	0.24X+0.25
Heptachlor	0.69C+0.04	0.06X+0.13	0.16X+0.08
Heptachlor epoxide	0.89C+0.10	0.18X-0.11	0.25X-0.08
Toxaphene	0.80C+1.74	0.09X+3.20	0.20X+0.22
PCB-1016	0.81C+0.50	0.13X+0.15	0.15X+0.45
PCB-1221	0.96C+0.65	0.29X-0.76	0.35X-0.62
PCB-1232	0.91C+10.79	0.21X-1.93	0.31X+3.50
PCB-1242	0.93C+0.70	0.11X+1.40	0.21X+1.52
PCB-1248	0.97C+1.06	0.17X+0.41	0.25X-0.37
PCB-1254	0.76C+2.07	0.15X+1.66	0.17X+3.62
PCB-1260	0.66C+3.76	0.22X-2.37	0.39X-4.86

$x'$  = Expected recovery for one or more measurements of a sample containing a concentration of C, in ug/L.

$s_{r'}$  = Expected single analyst standard deviation of measurements at an average concentration of X, in ug/L.

$S'$  = Expected interlaboratory standard deviation of measurements at an average concentration found of X, in ug/L.

C = True value for the concentration, in ug/L.

X = Average recovery found for measurements of samples containing a concentration of C, in ug/L.

**APPENDIX D**

**O. H. MATERIALS COMPANY  
ANALYTICAL RESULTS**

**RESULTS OF PRELIMINARY SITE SAMPLING/ANALYSIS**  
**ROSE CHEMICALS SITE - HOLDEN, MISSOURI**  
(DL = below detection limits)

SAMPLE NO.	DATE TAKEN	SAMPLE DESCRIPTION (See attached site sampling map)	Moisture Content %	PCB CONTENT (ppm) (DL = 0.2 ppm)			PCB CONTENT (ppb) (DL = 0.1 ppb)			PCB CONTENT (ug/600 g) (DL = 0.025 ug/600 g)			PCB CONTENT (ug/100cm <sup>2</sup> ) TOTAL
				1242	1260	TOTAL	1242	1260	TOTAL	1242	1260	TOTAL	
14092-1													
1	9/3/86	Soil composite between markers 1 and 2		6.1	3.6	11.7							
2	9/3/86	" " " 2 and 3		1.7	3.9	5.6							
3	9/3/86	" " " 3 and 4		1.1	1.1	2.2							
4	9/3/86	" " " 4 and 5		BDL	BDL	BDL							
5	9/3/86	" " " 5 and 6		BDL	BDL	BDL							
6	9/3/86	" " " 6 and 7		0.4	0.9	1.3							
7	9/3/86	" " " 7 and 8		3.5	5.6	9.1							
8	9/3/86	" " " 8 and 9		6.5	5.7	12.2							
9	9/3/86	" " " 9 and 10		BDL	0.2	0.2							
10	9/3/86	" " " 10 and 11		3.9	2.0	5.7							
11	9/3/86	" " " 11 and 12		BDL	BDL	BDL							
12	9/3/86	" " " 12 and 13		BDL	BDL	BDL							
13	9/3/86	" " " 13 and 14		BDL	0.4	0.4							
14	9/3/86	" " " 14 and 15		BDL	BDL	BDL							
15	9/3/86	" " " 15 and 16		BDL	BDL	BDL							
16	9/3/86	" " " 16 and 17		BDL	BDL	BDL							
17	9/3/86	" " " 17 and 18		BDL	BDL	BDL							
18	9/3/86	" " " 18 and 19		BDL	BDL	BDL							
19	9/3/86	" " " 19 and 20		BDL	BDL	BDL							
20	9/3/86	" " " 20 and 21		BDL	BDL	BDL							
21	9/3/86	" " " 21 and 22		0.7	3.1	3.8							
22	9/3/86	" " " 22 and 1		0.4	0.9	1.3							
23	9/4/86	Soil/sediment from creek bed, S. of culvert on 2nd St.		BDL	BDL	BDL							
24	9/5/86	" " " , near storm drain		0.8	0.9	1.7							
25	9/6/86	" " " , sewage plant road E. of culvert		0.2	0.4	0.6							
26	9/7/86	" " " , where two streams meet		0.5	0.6	1.1							
27	9/4/86	Water sludge tank (30'), city sewage plant, top					14.5	BDL	14.5				
28	9/4/86	" " " , middle					14.0	BDL	14.0				
29	-	Not sampled		-	-	-	-	-	-				
30	9/4/86	Sludge from manhole, city sanitary sewer main, near front gate	89.66	BDL	BDL	BDL							
31	9/4/86	" " " , on 2nd St. near gate	5.61	BDL	BDL	BDL							
32	9/4/86	" " " , 1st manhole on site	37.79	BDL	BDL	BDL							
33	9/4/86	" " " , far W. manhole cover											0.5
34	9/4/86	Effluent from city sewer plant					8.0	BDL	8.0				
35	9/4/86	Influent from city sewer plant					21.5	BDL	21.5				
36-44	-	Not sampled		-	-	-							
45	9/4/86	Soil, 150' S. of main sliding door of main building		BDL	0.4	0.4							
46	9/4/86	" , 40' N. of marker #10		0.6	1.7	2.3							
47	9/4/86	" , 18' S. of light pole		BDL	BDL	BDL							
48	9/4/86	" , 14' S. of light pole 3		BDL	BDL	BDL							
49	9/4/86	" , 25' N. of light pole 2		BDL	BDL	BDL							
50	9/4/86	" , 75' S. of main sliding door of main building		BDL	BDL	BDL							
51	9/4/86	Replicate of Sample #7		3.6	7.5	11.1							
52	9/4/86	" " 812		BDL	BDL	BDL							
53	9/4/86	" " 819		BDL	BDL	BDL							
54	9/4/86	Background - soil (surface grab), 400' E. of site front gate		BDL	1.6	1.6							
55	9/4/86	" " " , Millerausoleum/park		BDL	BDL	BDL							
56	9/4/86	" " " , Holden Baptist Temple		5.7	BDL	5.7							
57	9/4/86	" " " , Holden ball park		BDL	BDL	BDL							
58	9/4/86	" " " , Holden school/water tower		BDL	BDL	BDL							

SAMPLE NO.	DATE TAKEN	SAMPLE DESCRIPTION (See attached site sampling map)	Moisture Content %	PCB CONTENT (ppm) (DL = 0.2 ppm)			PCB CONTENT (ppb) (DL = 0.1 ppb)			PCB CONTENT (ug/600 l) (DL = 0.025 ug/600 l)			PCB CONTENT (ug/100ca2)	
				1242	1260	TOTAL	1242	1260	TOTAL	1242	1260	TOTAL	TOTAL	
59	9/4/86	Dried sludge, city sewage plant, E. drying pit (wet weight basis) (dry weight basis)	60.51	0.6	BDL	0.6	---	---	---	---	---	---	---	
60	9/3/86	* * * * , NE. drying pit (wet weight basis) (dry weight basis)	76.21	0.4	BDL	0.4	1.8	BDL	1.8	0.30	0.68	1.06	1.06	
61	9/3/86	Air sample from site perimeter, marker 05	0.19	BDL	0.19	0.19	0.19	BDL	0.19	BDL	BDL	BDL	BDL	
62	9/3/86	* * * * 010	0.19	BDL	0.19	0.19	0.19	BDL	0.19	BDL	BDL	BDL	BDL	
63	9/3/86	* * * * 014	0.19	BDL	0.19	0.19	0.19	BDL	0.19	BDL	BDL	BDL	BDL	
64	9/4/86	* * * * 017	0.19	BDL	0.19	0.19	0.19	BDL	0.19	BDL	BDL	BDL	BDL	
65	9/4/86	* * * * 06	0.19	BDL	0.19	0.19	0.19	BDL	0.19	BDL	BDL	BDL	BDL	
66	9/4/86	* * * * 09	0.30	0.68	1.06	0.30	0.68	1.06	0.30	0.68	1.06	1.06	1.06	
67	9/4/86	* * * * 01	1.44	7.9	9.34	1.44	7.9	9.34	1.44	7.9	9.34	9.34	9.34	
68	9/4/86	Travel blank	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
69a	9/9/86	Soil from creek bed at 0- 6 in. depth, taken near Sample 024	9.6	17.9	27.5	9.6	17.9	27.5	9.6	17.9	27.5	27.5	27.5	
69b	9/9/86	* * 6-12 in. depth, *	BDL	2.1	2.1	BDL	2.1	2.1	BDL	2.1	2.1	2.1	2.1	
70a	9/9/86	* * 0- 6 in. depth 50' downstream of Sample 069	BDL	1.0	1.0	BDL	1.0	1.0	BDL	1.0	1.0	1.0	1.0	
70b	9/9/86	* * 6-12 in. depth, *	0.3	1.4	1.7	0.3	1.4	1.7	0.3	1.4	1.7	1.7	1.7	
71a	9/9/86	* * 0- 6 in. depth 50' upstream of Sample 069	BDL	1.3	1.3	BDL	1.3	1.3	BDL	1.3	1.3	1.3	1.3	
71b	9/9/86	* * 6-12 in. depth, *	BDL	1.4	1.4	BDL	1.4	1.4	BDL	1.4	1.4	1.4	1.4	
72	9/9/86	Soil (surface grab), taken at corner of fence (marker 01)	0.7	1.9	2.6	0.7	1.9	2.6	0.7	1.9	2.6	2.6	2.6	
73	9/9/86	* * * * halfway point between markers 01 and 02	BDL	1.6	1.6	BDL	1.6	1.6	BDL	1.6	1.6	1.6	1.6	
74	9/9/86	* * * * marker 02 (near base of utility pole)	0.4	1.7	2.1	0.4	1.7	2.1	0.4	1.7	2.1	2.1	2.1	
75	9/9/86	* * * * halfway point between markers 02 and 03	0.5	1.9	2.4	0.5	1.9	2.4	0.5	1.9	2.4	2.4	2.4	
76	9/9/86	* * * * corner of fence (marker 06)	0.5	2.2	2.7	0.5	2.2	2.7	0.5	2.2	2.7	2.7	2.7	
77	9/9/86	* * * * marker 07 (S. of south warehouse)	2.6	7.5	10.1	2.6	7.5	10.1	2.6	7.5	10.1	10.1	10.1	
78	9/9/86	* * * * corner of fence (marker 08)	1.5	6.2	9.7	1.5	6.2	9.7	1.5	6.2	9.7	9.7	9.7	
79	9/9/86	* * * * marker 09	0.5	1.8	2.3	0.5	1.8	2.3	0.5	1.8	2.3	2.3	2.3	
80	9/9/86	* * * * marker 010	3.0	3.7	7.5	3.0	3.7	7.5	3.0	3.7	7.5	7.5	7.5	
81	9/9/86	* * * * marker 011	0.6	1.9	2.5	0.6	1.9	2.5	0.6	1.9	2.5	2.5	2.5	
82	9/9/86	* * * * NE corner of south warehouse	0.4	1.9	2.3	0.4	1.9	2.3	0.4	1.9	2.3	2.3	2.3	
83	9/9/86	* * * * SE *	158.0	15700.0	15858.0	158.0	15700.0	15858.0	158.0	15700.0	15858.0	15858.0	15858.0	
84	9/9/86	* * * * SW *	5.5	5.3	10.8	5.5	5.3	10.8	5.5	5.3	10.8	10.8	10.8	
85	9/9/86	* * * * NW *	0.3	BDL	0.3	0.3	BDL	0.3	0.3	BDL	0.3	0.3	0.3	
86	9/9/86	Background - soil (surface grab), Holden Baptist Temple gate	3.2	6.0	9.2	3.2	6.0	9.2	3.2	6.0	9.2	9.2	9.2	
87	9/9/86	, same spot as Sample 056	0.2	1.5	1.7	0.2	1.5	1.7	0.2	1.5	1.7	1.7	1.7	

ATTACHMENT 1

LOCATION OF SAMPLES ROSE CHEMICAL CO. SITE

• EPA SPLIT LIST

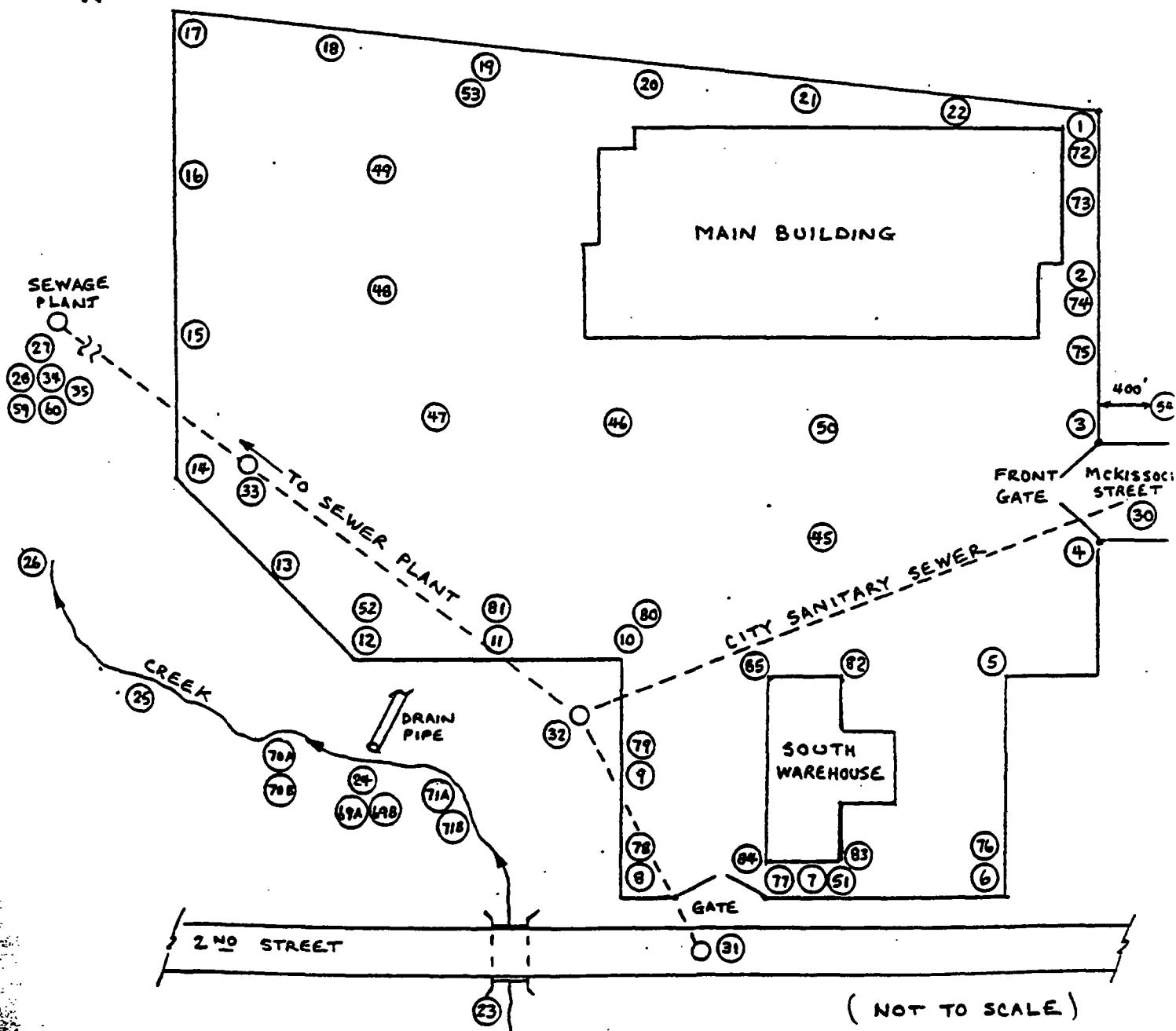
(2) (8) (10) (17) (23) (24)  
(27) (28) (29) (34) (31) (32) (50)

• BACKGROUND SAMPLES : (54) 400' E. OF FRONT GATE

(55) MILLER MAUSOLEUM  
(56) (86) (87) HOLDEN BAPTIST TEMPLE  
(57) HOLDEN BALL PARK  
(58) HOLDEN WATER TOWER

• SEWAGE TREATMENT PLANT SAMPLES : (27) (28) (34) (35) (59) (60)

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THE ENVIRONMENTAL SERVICES COMPANY

O.H. MATERIALS CO.  
16406 U.S. Route 204 East  
P.O. Box 455  
Findlay, Ohio 45839-0551  
Phone: 419-423-3526  
800-537-9540 (24 hr)  
800-537-9660 (in Ohio)  
Telex 239248 OHMIL JR PCA

October 20, 1986

Mr. Roger Van Zele  
Manager, Project Control  
Clean Sites Inc.  
1199 N. Fairfax Street  
Alexandria, VA 22314

Dear Mr. Van Zele:

RE: Analytical Results from the Rose Chemical Site,  
Holden, Missouri

Enclosed is the information that you requested regarding the air monitoring and initial drum sampling results.

The air samples were taken on florisil tubes at a rate of 1.0 liters/minute for 60 to 90 minutes, for a total sample volume of 60 to 90 liters. The collection tubes were pointed into the wind and were positioned 4-feet above the ground. The wind was out of the Southwest and the day was breezy. Results have been converted to micrograms per cubic meter of air (Attachment 1).

Drum samples were tested for compatibility. This series of testing is qualitative only and additional testing is required for positive results for a given parameter. It is recommended that all positive cyanide results be retested for total and amenable cyanide under USEPA SW-846 Method 9010 and positive sulfide results by Method 9030 for quantitative results. Positive cyanide and sulfide results that need additional confirmation are highlighted on the original laboratory report (Attachment 2).

If you have any further questions or need additional assistance from me or our staff please feel free to call.

Sincerely,

Mike A. Edelbrock  
Senior Project Chemist

ME:smb

## (ATTACHMENT 1)

**TABLE 1 - POLYCHLORINATED BIPHENYLS IN AIR SAMPLES**(All concentrations are reported in ug/m<sup>3</sup>)

Sample Number	Concentration (ug/m <sup>3</sup> )
4092-61	1.97 (Aroclor 1242)
4092-62	BDL
4092-63	BDL
4092-64	BDL
4092-65	BDL
4092-66	6.14 (Aroclor 1242) 11.0 (Aroclor 1260)
4092-67	20.2 (Aroclor 1242) 111 (Aroclor 1260)
4092-68	BDL

Limit of Detection = 0.25 ug/m<sup>3</sup>  
BDL = Below Detection Limit

**APPENDIX E**

**CHEMICAL WASTE MANAGEMENT, INC.  
ANALYTICAL RESULTS**

RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

Sample Number*	Sample Description (see Map)	PCB Content (mg/kg)**		
		1242	1260	Total
Q-1	50' X 50' Grid Soil Composite	BDL	2.5	2.5
Q-2	" " " "	BDL	9.8	9.8
Q-3	" " " "	BDL	1.3	1.3
Q-4	" " " "	BDL	1.9	1.9
Q-5	" " " "	3.4	7.3	10.7
Q-6	" " " "	2.1	20.6	22.7
Q-7	" " " "	2.8	38.4	41.2
Q-8	" " " "	1.1	20.0	21.1
Q-001	" " " "	0.70	1.5	2.2
Q-002	" " " "	0.57	2.1	2.67
Q-003	" " " "	0.6	1.9	2.50
Q-004	" " " "	1.3	2.5	3.8
Q-005	" " " "	1.6	3.4	5.0
Q-006	" " " "	0.40	2.0	2.4
Q-007	" " " "	0.74	2.6	3.34
Q-008	" " " "	0.51	1.1	1.61
Q-009	" " " "	5.9	5.5	11.4
Q-010	" " " "	0.82	2.1	2.92
Q-011	" " " "	0.76	1.7	2.46
Q-012	" " " "	1.2	2.8	4.0
Q-013	" " " "	0.38	1.4	1.78
Q-014	" " " "	0.43	2.8	3.23
Q-015	" " " "	0.52	2.8	3.32
Q-016	" " " "	1.1	2.7	3.8
Q-017	" " " "	BDL	0.46	0.46
Q-018	" " " "	1.4	3.7	5.1
Q-019	" " " "	0.54	1.3	1.84
Q-020	" " " "	1.8	4.0	5.8
Q-021	" " " "	BDL	BDL	BDL
Q-022	" " " "	BDL	0.41	0.41
Q-023	" " " "	0.40	1.4	1.8
Q-024	" " " "	3.2	7.0	10.2
Q-025	" " " "	0.2	0.7	0.9
Q-026	" " " "	10.	5.3	15.3
Q-027	" " " "	36.	31.	67.
Q-028	" " " "	2.1	4.1	6.2
Q-029	" " " "	1.3	1.8	3.1
Q-030	" " " "	3.9	3.9	7.8

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TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg)**</u>		
		<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-031	50'X50' Grid Soil Composit	0.9	1.8	2.7
Q-032	" " "	6.8	14.0	20.8
Q-033	" " "	41.0	40.0	81.0
Q-034	" " "	8.6	6.6	15.2
Q-035	" " "	112.	116.	228.
Q-036	" " "	0.7	0.8	1.5
Q-037	" " "	698.	13,472.	14,170.
Q-038	" " "	0.2	1.2	1.4
Q-039	" " "	3.7	14.	17.7
Q-040	" " "	15.	15.	30.
Q-041	" " "	16.0	3.6	19.6
Q-042	" " "	1.5	2.7	4.2
Q-043	" " "	1.3	3.2	4.5
Q-044	" " "	42.	8.6	50.6
Q-045	" " "	1.4	1.4	2.8
Q-046	" " "	1.4	2.1	3.5
Q-046-DU	" " "	1.7	1.9	3.6
Q-047	" " "	1.8	6.1	7.9
Q-048	" " "	1.8	4.9	6.7
Q-049	" " "	5.8	2.7	8.5
Q-050	" " "	BDL	BDL	BDL
Q-051	" " "	8.1	48.	56.1
Q-052	" " "	0.4	1.7	2.1
Q-053	" " "	BDL	BDL	BDL
Q-054-R	" " "	BDL	BDL	BDL
Q-055	" " "	34.	54.	88.
Q-056	" " "	10.	59.	69.
Q-057	" " "	2.0	4.9	6.9
Q-058	" " "	6.0	9.2	15.2
Q-059	" " "	4.7	6.4	11.1
Q-060	" " "	0.5	1.3	1.8
Q-061	" " "	BDL	BDL	BDL
Q-062	" " "	4.9	8.2	13.1
Q-063-R	" " "	542.	444.	986.
Q-064	" " "	BDL	0.6	0.6
Q-065	" " "	BDL	BDL	BDL
Q-066	" " "	8.5	20.0	28.5
Q-066-DU	" " "	2.7	12.0	14.7

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg)**</u>		
		<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-066A-DU	50' x 50' Grid Soil Composite	16.0	53.0	69.0
Q-067	" " "	BDL	BDL	BDL
Q-068	" " "	BDL	BDL	BDL
Q-069	" " "	12.0	14.2	26.2
Q-070	" " "	0.64	1.0	1.64
Q-071	" " "	0.39	0.71	1.10
Q-072	" " "	0.42	0.75	1.17
Q-073	" " "	0.47	1.3	1.77
Q-074	" " "	0.22	0.48	0.70
Q-075	" " "	0.42	1.6	2.02
Q-076	" " "	BDL	0.48	0.48
Q-077	" " "	0.26	1.0	1.26
Q-078	" " "	BDL	BDL	BDL
Q-079	" " "	0.35	0.44	0.79
Q-080	" " "	0.67	0.97	1.64
Q-081	" " "	BDL	0.52	0.52
Q-082	" " "	BDL	BDL	BDL
Q-083	" " "	1.0	2.9	3.9
Q-084	" " "	3.2	7.7	10.9
Q-085	" " "	BDL	0.35	0.35
Q-086	" " "	BDL	0.29	0.29
Q-086-DU	" " "	4.4	11.0	15.4
Q-087	" " "	0.64	0.66	1.30
Q-088	" " "	BDL	BDL	BDL
Q-089	" " "	BDL	BDL	BDL
Q-090	" " "	BDL	BDL	BDL
Q-091	" " "	BDL	BDL	BDL
Q-092	" " "	BDL	BDL	BDL
Q-093	" " "	0.42	0.60	1.02
Q-094	" " "	BDL	BDL	BDL
Q-095	" " "	BDL	BDL	BDL
Q-096	" " "	0.21	1.0	1.21
Q-097	" " "	6.5	3.8	10.3
Q-098	" " "	0.36	0.33	0.69
Q-099	" " "	BDL	BDL	BDL
Q-100	" " "	BDL	BDL	BDL
Q-101	" " "	BDL	BDL	BDL
Q-102	" " "	BDL	BDL	BDL

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TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg) **</u>	<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-103	50' X 50' Grid Soil Composite		BDL	0.51	0.5
Q-103-DU	" " " " "		BDL	BDL	BDL
Q-104	" " " " "		1.1	1.5	2.6
Q-105	" " " " "		BDL	0.35	0.3
Q-106	" " " " "		BDL	BDL	BDL
Q-106-DU	" " " " "		BDL	BDL	BDL
Q-107	" " " " "		0.29	0.59	0.8
Q-108	" " " " "		BDL	BDL	BDL
Q-109	" " " " "		BDL	BDL	BDL
Q-110	" " " " "		BDL	BDL	BDL
Q-111	" " " " "		0.62	1.2	1.8
Q-112	" " " " "		BDL	BDL	BDL
Q-113	" " " " "		BDL	BDL	BDL
Q-114	" " " " "		BDL	BDL	BDL
Q-115	" " " " "		BDL	BDL	BDL
Q-116	" " " " "		BDL	BDL	BDL
Q-117	" " " " "		BDL	BDL	BDL
Q-118	" " " " "		BDL	BDL	BDL
Q-119	" " " " "		BDL	0.44	0.4
Q-120	" " " " "		BDL	BDL	BDL
Q-121	" " " " "		BDL	BDL	BDL
Q-122	" " " " "		BDL	BDL	BDL
Q-123	" " " " "		BDL	BDL	BDL
Q-124	" " " " "		BDL	BDL	BDL
Q-125	" " " " "		BDL	BDL	BDL
Q-126	" " " " "		BDL	BDL	BDL
Q-126-DU	" " " " "		BDL	BDL	BDL
Q-127	" " " " "		BDL	BDL	BDL
Q-128	" " " " "		BDL	0.36	0.3
Q-129	" " " " "		BDL	BDL	BDL
Q-130	" " " " "		BDL	BDL	BDL
Q-131	" " " " "		BDL	BDL	BDL
Q-132	" " " " "		BDL	BDL	BDL
Q-133	" " " " "		BDL	BDL	BDL
Q-134	" " " " "		BDL	BDL	BDL
Q-135	" " " " "		BDL	BDL	BDL
Q-136	" " " " "		BDL	BDL	BDL
Q-137	" " " " "		BDL	0.24	0.2

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TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

Sample Number*	Sample Description (see Map)	PCB Content (mg/kg)**		
		1242	1260	Total
Q-138	50' X 50' Grid Soil Composite	BDL	BDL	BDL
Q-139	" " " " "	BDL	BDL	BDL
Q-140	" " " " "	BDL	BDL	BDL
Q-141	" " " " "	BDL	BDL	BDL
Q-142	" " " " "	BDL	BDL	BDL
Q-143	" " " " "	BDL	BDL	BDL
Q-144	" " " " "	BDL	BDL	BDL
Q-145	" " " " "	BDL	0.31	0.31
Q-146	" " " " "	BDL	BDL	BDL
Q-146-DU	" " " " "	BDL	BDL	BDL
Q-147	" " " " "	BDL	BDL	BDL
Q-148	" " " " "	BDL	BDL	BDL
Q-149	" " " " "	0.22	2.9	3.12
Q-150	" " " " "	BDL	BDL	BDL
Q-151	" " " " "	BDL	0.24	0.24
Q-152	" " " " "	BDL	BDL	BDL
Q-153	" " " " "	BDL	BDL	BDL
Q-154	" " " " "	BDL	BDL	BDL
Q-155	" " " " "	BDL	BDL	BDL
Q-156	" " " " "	BDL	BDL	BDL
Q-157	" " " " "	BDL	BDL	BDL
Q-158	" " " " "	BDL	BDL	BDL
Q-159	" " " " "	BDL	0.50	0.50
Q-160	" " " " "	0.39	1.1	1.49
Q-161	" " " " "	1.0	1.8	2.8
Q-162	" " " " "	1.8	3.8	5.6
Q-163	" " " " "	7.0	23.	30.
Q-164	" " " " "	4.6	11.5	16.1
Q-165	" " " " "	0.3	6.4	6.7
Q-166	" " " " "	BDL	BDL	BDL
Q-166-DU	" " " " "	BDL	BDL	BDL
Q-167	" " " " "	15.9	8.9	24.8
Q-168	" " " " "	0.28	0.31	0.59
Q-169	" " " " "	BDL	BDL	BDL
Q-170	" " " " "	1.2	2.0	3.2
Q-171	" " " " "	0.24	0.32	0.56
Q-172	" " " " "	21.	19.	40.
Q-173	" " " " "	BDL	BDL	BDL

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TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg)**</u>	<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-174	50'X50' Grid Soil Composite		BDL	BDL	BDL
Q-175	" " " "		BDL	BDL	BDL
Q-176	" " " "		0.45	0.73	1.18
Q-177	" " " "		1.4	2.4	3.8
Q-178	" " " "		2.6	5.5	8.1
Q-179	" " " "		BDL	BDL	BDL
Q-180	" " " "		0.38	0.67	1.05
Q-181	" " " "		8.3	15.0	23.3
Q-182	" " " "		7.2	5.2	12.4
Q-182-DU	" " " "		0.82	1.4	2.22
Q-183	" " " "		0.36	0.38	0.74
Q-184	" " " "		3.3	1.6	4.9
Q-185	" " " "		BDL	0.43	0.43
Q-185-DU	" " " "		0.68	0.31	0.99
Q-186	" " " "		BDL	BDL	BDL
Q-187	" " " "		BDL	BDL	BDL
Q-187-DU	" " " "		BDL	BDL	BDL
Q-188	" " " "		BDL	BDL	BDL
Q-189	" " " "		BDL	BDL	BDL
Q-190	" " " "		BDL	BDL	BDL
Q-191	" " " "		BDL	BDL	BDL
Q-192	" " " "		BDL	BDL	BDL
Q-193	" " " "		BDL	BDL	BDL
Q-194	" " " "		BDL	BDL	BDL
Q-195	" " " "		BDL	BDL	BDL
Q-196	" " " "		BDL	BDL	BDL
Q-197	" " " "		BDL	BDL	BDL
Q-199	" " " "		BDL	BDL	BDL
Q-201	" " " "		BDL	BDL	BDL
Q-202	" " " "		BDL	BDL	BDL
Q-203	" " " "		BDL	BDL	BDL
Q-204	" " " "		BDL	BDL	BDL
Q-207	" " " "		2.1	2.8	4.9
Q-208	" " " "		0.31	0.75	1.06
Q-209	" " " "		1.1	1.1	2.2
Q-2A	25'X25' Grid Soil Composite		7.3	7.3	14.6
Q-2B	" " " "		1.3	3.7	5.0
Q-2C	Q-2 Triangular - No Composite		---	---	---

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

Sample Number*	Sample Description (see Map)	PCB Content (mg/kg) **		
		1242	1260	Total
Q-2D	25'X25' Grid Soil Composite	2.5	8.5	11.0
Q-5A	" "	7.0	7.0	14.0
Q-5B	" "	1.1	4.6	5.7
Q-5C	" "	0.52	2.5	3.02
Q-5D	" "	0.35	1.2	1.55
Q-6A	" "	1.8	4.9	6.7
Q-6B	" "	3.9	4.2	8.1
Q-6C	" "	1.6	4.2	5.8
Q-6D	" "	0.49	0.83	1.32
Q-7A	" "	2.4	7.3	9.7
Q-7B	" "	4.1	18.7	22.8
Q-7C	" "	1.7	13.2	14.9
Q-7D	" "	3.2	13.2	16.4
Q-8A	" "	BDL	BDL	BDL
Q-8B	" "	2.4	9.8	12.2
Q-8C	" "	0.25	0.91	1.16
Q-8D	" "	0.63	1.6	2.23
Q-018A	" "	1.3	4.0	5.3
Q-018B	" "	14.0	4.3	18.3
Q-018C	" "	0.55	0.91	1.46
Q-018D	" "	BDL	BDL	BDL
Q-019A	" "	0.54	0.87	1.41
Q-019B	" "	0.59	0.62	1.21
Q-019C	" "	2.1	1.6	3.7
Q-019D	" "	4.8	3.8	8.6
Q-020A	" "	2.1	4.9	7.0
Q-020B	" "	0.65	2.4	3.05
Q-020C	" "	1.7	5.7	7.4
Q-020D	" "	2.0	8.3	10.3
Q-026A	" "	108.0	31.0	139.0
Q-026B	" "	8.7	10.7	20.4
Q-026C	" "	28.3	20.0	48.3
Q-026D	" "	1.2	2.4	3.6
Q-027A	" "	61.0	128.0	189.0
Q-027B	" "	14.9	34.0	48.9
Q-027C	" "	26.0	129.0	155.0
Q-027D	" "	9.9	15.1	25.0
Q-028A	" "	4.0	12.6	16.6

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

Sample Number*	Sample Description (see Map)	PCB Content (mg/kg) **		
		1242	1260	Total
Q-028B	" " "	0.26	3.6	3.86
Q-028C	" " "	107.	54.	161.
Q-028D	" " "	BDL	0.61	0.61
Q-030A	" " "	8.3	8.7	17.0
Q-030B	" " "	2.1	0.83	2.93
Q-030C	" " "	33.	36.	69.
Q-030D	" " "	0.23	0.39	0.62
Q-032A	" " "	2.1	4.6	6.7
Q-032B	" " "	5.8	9.5	15.3
Q-032C	" " "	14.	28.	42.
Q-032D	" " "	59.	82.	141.
Q-033A	" " "	51.	45.	96.
Q-033B	" " "	23.	17.	40.
Q-033C	" " "	2.1	5.8	7.9
Q-033D	" " "	1.5	4.2	5.7
Q-034A	" " "	1.2	2.3	3.5
Q-034B	" " "	2.9	6.7	9.6
Q-034C	" " "	2.5	4.6	7.1
Q-034D	" " "	56.	119.	175.
Q-035A	" " "	83.	92.	175.
Q-035B	Concrete Pad - No Sample	----	----	----
Q-035C	25'X25' Grid Soil Sample	8.6	31.0	39.6
Q-035D	" " "	15.8	21.7	37.5
Q-037A	Concrete Pad - No Sample	----	----	----
Q-037B	25'X25' Grid Soil Sample	BDL	1,530.	1,530.
Q-037C	" " "	20.	76.	96.
Q-037D	" " "	21.	226.	247.
Q-039A	" " "	74.	BDL	74.
Q-039B	" " "	0.54	2.3	2.84
Q-039C	" " "	3.5	10.4	13.9
Q-039D	" " "	3.1	6.5	9.6
Q-040A	" " "	2.3	3.0	5.3
Q-040B	" " "	28.4	35.6	64.0
Q-040C	" " "	2.2	3.5	5.7
Q-040D	" " "	3.0	4.4	7.4
Q-041A	" " "	1.6	2.8	4.4
Q-041B	" " "	16.0	1.0	17.0
Q-041C	" " "	14.6	4.9	19.5

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg)**</u>		
		<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-041D	25'X25' Grid Soil Sample	2.4	0.77	3.17
Q-044A	" " "	4.7	4.2	8.9
Q-044B	" " "	3.7	5.1	8.8
Q-044C	" " "	0.81	2.0	2.81
Q-044D	" " "	3.0	5.0	8.0
Q-047A	" " "	BDL	1.0	1.0
Q-047B	" " "	12.3	52.8	65.1
Q-047C	" " "	0.48	0.58	1.06
Q-047D	" " "	1.3	1.8	3.1
Q-048A	" " "	0.98	2.8	3.78
Q-048B	" " "	3.3	7.4	10.7
Q-048C	" " "	0.52	0.66	1.18
Q-048D	" " "	0.52	2.2	2.72
Q-049A	" " "	51.6	25.	76.6
Q-049B	" " "	77.	41.	118.
Q-049C	Q-049 Too Narrow for C & D	---	---	---
Q-049D	" " " " " " " "	---	---	---
Q-051A	25'X25' Grid Soil Composite	BDL	BDL	BDL
Q-051B	" " " " " " "	2.3	6.5	8.8
Q-051C	" " " " " " "	BDL	BDL	BDL
Q-051D	" " " " " " "	3.9	11.7	15.6
Q-054A	" " " " " " "	BDL	BDL	BDL
Q-054B	" " " " " " "	BDL	BDL	BDL
Q-054C	" " " " " " "	BDL	BDL	BDL
Q-054D	" " " " " " "	BDL	BDL	BDL
Q-054A-DU	" " " " " " "	BDL	BDL	BDL
Q-054B-DU	" " " " " " "	BDL	BDL	BDL
Q-054C-DU	" " " " " " "	BDL	BDL	BDL
Q-054D-DU	" " " " " " "	BDL	BDL	BDL
Q-055A	" " " " " " "	2.9	20.7	23.6
Q-055B	" " " " " " "	1.8	1.1	2.9
Q-055C	" " " " " " "	0.75	0.95	1.70
Q-055D	" " " " " " "	13.5	93.9	107.4
Q-056A	" " " " " " "	5.8	3.1	8.9
Q-056B	" " " " " " "	472.	407.	879.
Q-056C	" " " " " " "	0.5	1.2	1.7
Q-056D	" " " " " " "	3.3	5.1	8.4
Q-057A	" " " " " " "	566.	4,680.	5,246.

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>	<u>PCB Content (mg/kg)**</u>		
		<u>1242</u>	<u>1260</u>	<u>Total</u>
Q-057B	25'X25' Grid Soil Composite	10.4	22.7	33.1
Q-057C	" " " " "	24.1	32.9	57.0
Q-057D	" " " " "	22.7	25.0	47.7
Q-058A	" " " " "	20.6	29.7	50.3
Q-058B	" " " " "	80.0	291.	371.0
Q-058C	" " " " "	2.6	2.6	5.2
Q-058D	" " " " "	4.0	8.8	12.8
Q-059A	" " " " "	1.2	BDL	1.2
Q-059B	" " " " "	5.5	2.2	7.7
Q-059C	" " " " "	22.9	37.1	60.0
Q-059D	" " " " "	4.1	3.5	7.6
Q-062A	" " " " "	2.6	6.1	8.7
Q-062B	Concrete Pad - No Sample	---	---	---
Q-062C	" " " " "	---	---	---
Q-062D	" " " " "	---	---	---
Q-066A	25'X25' Grid Soil Composite	10.0	13.8	23.8
Q-066B	" " " " "	1.5	1.1	2.6
Q-066C	Concrete Pad - No Sample	---	---	---
Q-066D	" " " " "	---	---	---
Q-069A	25'X25' Grid Soil Composite	31.1	42.5	73.6
Q-069B	" " " " "	1.9	7.3	9.2
Q-069C	" " " " "	0.88	1.6	2.48
Q-069D	" " " " "	0.96	1.8	2.76
Q-084A	" " " " "	4.7	5.2	9.9
Q-084B	" " " " "	BDL	476.	476.
Q-084C	" " " " "	1.4	1.7	3.1
Q-084D	" " " " "	9.0	27.9	36.9
Q-097A	" " " " "	0.62	1.7	2.32
Q-097B	" " " " "	0.54	1.7	2.24
Q-097C	" " " " "	0.33	1.6	1.93
Q-097D	" " " " "	1.3	9.5	10.8
Q-167A	" " " " "	2.1	1.6	3.7
Q-167B	" " " " "	1.6	1.7	3.3
Q-167C	" " " " "	15.6	15.2	30.8
Q-167D	" " " " "	0.95	0.85	1.80
Q-172A	" " " " "	2.3	3.0	5.3
Q-172B	" " " " "	11.8	26.4	38.2
Q-172C	" " " " "	1.5	8.8	10.3
Q-172D	" " " " "	4.7	11.2	15.9

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

Sample Number*	Sample Description (see Map)	PCB Content (mg/kg) **		
		1242	1260	Total
Q-178A	25'X25' Grid Soil Composite	BDL	0.79	0.79
Q-178B	" " " " "	BDL	0.81	0.81
Q-178C	Q-178 too narrow for C & D	—	—	—
Q-178D	" " " " "	—	—	—
Q-181A	25'X25' Grid Soil Composite	BDL	1.6	1.6
Q-181B	" " " " "	0.41	1.7	2.11
Q-181C	Q-181 too narrow for C & D	—	—	—
Q-181D	" " " " "	—	—	—
Q-182A	25'X25' Grid Soil Composite	0.87	1.8	2.67
Q-182B	" " " " "	14.9	38.2	53.1
Q-182C	Q-182 too narrow for C & D	—	—	—
Q-182D	" " " " "	—	—	—
Q-200A	25'X25' Grid Soil Composite	2.0	0.52	2.52
Q-200B	" " " " "	10.2	9.2	19.4
Q-200C	Q-200 too narrow for C & D	—	—	—
Q-200D	" " " " "	—	—	—
Q-201A	25'X25' Grid Soil Composite	2.9	2.9	4.9
Q-201B	" " " " "	0.38	0.99	1.37
Q-201C	Q-201 too narrow for C & D	—	—	—
Q-201D	" " " " "	—	—	—
SPA	Soil Pile at East End of Site	4.0	17.0	—
DM23	Dirt Mound at SW Corner of Site	0.48	0.74	1.22
DM24	" " " " "	BDL	0.81	0.81
STR-11	Bank Along Ditch to Retention Pond PO-03	BDL	BDL	BDL
STR-12	" " " " "	BDL	BDL	BDL
STR-13	" " " " "	BDL	BDL	BDL
STR-14	" " " " "	BDL	BDL	BDL
PIT069-1	Bank of Pit at NW Corner of Main Bldg.	19.3	106.	125.3
PIT069-2	" " " " "	3.2	2.9	6.1
PIT069-3	" " " " "	9.6	11.9	21.5
PIT069-4	" " " " "	1.3	2.6	3.9
PO-02-M	Soil/Sediment from Middle of Pond-02	1,132.	BDL	1,132.

TABLE A-1  
RESULTS OF SOIL SAMPLING/ANALYSIS  
ROSE CHEMICALS SITE - HOLDEN, MO

<u>Sample Number*</u>	<u>Sample Description (see Map)</u>		<u>PCB Content (mg/kg)**</u>		
			<u>1242</u>	<u>1260</u>	<u>Total</u>
PO-03-1M	NE Soil/Sediment from Middle NE of Pond-03	1.6	BDL	1.6	
PO-03-2M	N " " " N "	0.46	2.3	2.76	
PO-03-3M	NW " " " NW "	BDL	2.1	2.1	
PO-03-9M	SW " " " SW "	BDL	1.4	1.4	
PO-03-10M	SE " " " SE "	1.3	3.9	5.2	
PO-03-17B	Soil from Bank of Pond-03	BDL	1.9	1.9	
PO-03-18B	" " " "	BDL	0.97	0.97	
PO-03-21B	" " " "	0.24	2.6	2.84	
PO-03-22B	" " " "	BDL	24.8	24.8	
PO-04-4M	NE Soil/Sediment from Middle NE of Pond-04	BDL	1.8	1.8	
PO-04-5M	N " " " N "	BDL	1.5	1.5	
PO-04-6M	NW " " " NW "	BDL	1.3	1.3	
PO-04-7M	SE " " " SE "	BDL	1.5	1.5	
PO-04-8M	SE " " " SE "	BDL	1.4	1.4	
PO-04-18B	Soil from Bank of Pond-04	BDL	1.2	1.2	
PO-04-19B	" " " "	BDL	BDL	BDL	
PO-04-20B	" " " "	BDL	BDL	BDL	
PO-05-15	Soil from Bank Around Dirt Pile Near Pond-05	BDL	BDL	BDL	
PO-05-16	" " " " " "	BDL	BDL	BDL	
PO-05-25	Soil from Bank of Pond-05	BDL	0.70	0.70	
PO-05-26	" " " "	BDL	1.1	1.1	
PO-05-27	" " " "	BDL	0.75	0.75	
PO-05-28	" " " "	BDL	BDL	BDL	
SDW	Soil Around Storm Drain NW of S Warehouse	1.4	0.34	1.74	
SDE	Soil " " " NE " " "	2.9	5.9	8.8	
Q-205A	25'X25' Grid Soil Composite	6.7	10.7	17.4	
Q-205B	" " " " "	1.2	2.7	3.9	
Q-205C	" " " " "	7.8	10.0	17.8	
Q-205D	" " " " "	26.3	19.2	45.5	
Q-206A	" " " " "	6.3	10.0	16.3	
Q-206B	" " " " "	14.1	16.0	30.1	
Q-206C	" " " " "	0.32	1.3	1.62	
Q-206D	" " " " "	0.39	1.2	1.59	

\* Samples collected by Chemical Waste Management, Inc.

G = Grab soil sample      -DU = Duplicate sample (not a split)

P = Perimeter soil sample      -R = Resampled

Q = Quadrant soil sample

\*\* Samples analyzed by Langston Laboratories, Inc.

mg/kg = milligrams per kilogram, dry weight basis (wt/wt. ppm)

BDL = below detection limit (0.2 mg/kg)

TABLE C-1

SUMMARY OF AIR MONITORING DATA (a)ROSE CHEMICALS SITE - HOLDEN, MISSOURI

<u>Date</u>	<u>Time</u>	<u>Rate (L/min)</u>	<u>Temp F</u>	<u>Humidity (% Relative)</u>	<u>Wind Dir./Loc.</u>	<u>Wind Speed (inch)</u>	<u>Comments</u>	<u>Monitor Locations</u>	<u>PCB Level (ng/n3) (Detection Limit = 0.0004)</u>
2/25/87	Blank	—	—	—	—	—	—	—	BDL
3/4/87	Control	—	—	—	—	—	—	—	BDL
3/4/87	Start:08:30 Finish:11:30	1.5 1.5	51 66	44 50	S-SU S-SU	12 15-20	Sunny No Change	Upwinds: At Fence U of S Warehouse Downwinds: At Fence NU of Main Bldg.	BDL BDL
3/5/87	Control	—	—	—	—	—	—	—	BDL
3/5/87	Start:08:30 Finish:14:30	0.75 0.75	48 78	53 —	SU NW	5-15 0-10	Sunny. Wind began to shift to the NW at about 11:30	Upwind East: At Fence U of S Warehouse Upwind West: At Fence W of Retention Pond PD-04 Downwind East: At Fence 20' N of Entrance Gate Downwind West: At Fence N of Main Bldg.	BDL BDL BDL BDL
3/6/87	Start:08:45 Finish:14:45	0.75 0.75	50 75	66 29	SE S	0-9 10-15	Sunny. Wind shifted between 10:00 and 14:30	Upwind South: At Fence 30' S of Entrance Gate Upwind North: At Fence Corner NE of Main Bldg. Downwind South: Open area Pond PD-02 and Pond PD-03 Downwind North: At Fence N of W end of Main Bldg.	BDL BDL BDL BDL
3/9/87	Control	—	—	—	—	—	—	—	BDL
3/9/87	Start:07:00 Finish:13:00	0.75 0.75	35 36	88 100	N-NE N	15-25 15-25	Cloudy, Occasional Drizzle	Upwind East: At Fence Corner NE of Main Bldg. Upwind West: At Fence N of U end of Main Bldg. Downwind East: At Fence S of SE Corner of S Warehouse. Downwind West: At Fence along road at SU Corner of Site	BDL BDL BDL BDL
3/13/87	Start:08:30 Finish:15:30	0.75 0.75	46 54	53 53	S S	5-15 17	—	Upwind East: At Fence S of E end of S Warehouse Upwind West: At Fence Corner SU of Main Bldg. Downwind East: At Fence Corner NE of Main Bldg. Downwind West: At Fence N of NW Corner of Main Bldg.	BDL BDL BDL BDL

(a) Samples collected by Chemical Waste Management, Inc. and analyzed by Langston Laboratories, Inc.  
(Sample collection started but not completed 3/10/87)

TABLE C-2  
RESULTS OF AIR MONITORING IN WORK AREAS INSIDE MAIN BLDG.

ROSE CHEMICALS SITE - HOLDEN, MO.

Sample #	Sample Location <sup>a</sup>	Concentration <sup>b</sup>		PEL mg/m <sup>3</sup>
		Arochlor 1242/ Arochlor 1254	mg/m <sup>3</sup>	
001	BLD 200 SEC 7	0.035/ 0.008	1/ 0.5	
002	BLANK	0/ 0	1/ 0.5	
003	BLD 100 SEC 5	0.017/ 0.008	1/ 0.5	
004	BLANK	0/ 0	1/ 0.5	
005	BLD 100 SEC 9	0.018/ 0.011	1/ 0.5	
006	BLANK	0/ 0	1/ 0.5	
007	BLD 200 SEC 7	0.039/ 0.011	1/ 0.5	
008	BLANK	0/ 0	1/ 0.5	
009	LIQ DRUM OPENER	0.003/ 0.009	1/ 0.5	
010	BLANK	0/ 0	1/ 0.5	
011	LIQ DRUM SAMPLER	0.016/ 0.005	1/ 0.5	
012	BLANK	0/ 0	1/ 0.5	
013	FORKLIFT OP	0.014/ 0.004	1/ 0.5	
014	BLANK	0/ 0	1/ 0.5	
015	LABEL SCANNER	0.021/ 0.007	1/ 0.5	
016	BLANK	0/ 0	1/ 0.5	
017	BLD 100 SEC 11	0.030/ ND*	1/ 0.5	
018	BLANK	0/ 0	1/ 0.5	
019	BLD 300 SEC 8	0.045/ ND*	1/ 0.5	
020	BLANK	0/ 0	1/ 0.5	
021	BLD 100 SEC 2	0.014/ 0.004	1/ 0.5	
022	BLANK	0/ 0	1/ 0.5	
023	BLD 100 SEC 4	0.007/ 0.005	1/ 0.5	
024	BLANK	0/ 0	1/ 0.5	
025	LABEL SCANNER	0.032/ 0.013	1/ 0.5	
026	BLANK	0/ 0	1/ 0.5	
027	LABEL SCANNER	0.058/ 0.031	1/ 0.5	
028	BLANK	0/ 0	1/ 0.5	
029	FORK LIFT OP	0.095/ 0.071	1/ 0.5	
030	BLANK	0/ 0	1/ 0.5	
031	BANDER	0.105/ 0.038	1/ 0.5	
032	BLANK	0/ 0	1/ 0.5	
033	SOL DRUM OPENER	0.084/ 0.061	1/ 0.5	
034	BLANK	0/ 0	1/ 0.5	
035	SOL DRUM OPENER	0.064/ 0.054	1/ 0.5	
036	VOID	VOID		
037	OFFICE TRAILER	0.002/ ND*	1/ 0.5	
038	BLANK	0/ 0	1/ 0.5	
039	SAMP STR ROOM	0.024/ 0.004	1/ 0.5	
040	BLANK	0/ 0	1/ 0.5	
041	VOID	VOID		
042	VOID	VOID		
043	LIQ DRUM SAMPLER	0.013/ 0.005	1/ 0.5	
044	BLANK	0/ 0	1/ 0.5	

\* None detected. Detection limit = 0.0004 mg/m<sup>3</sup>

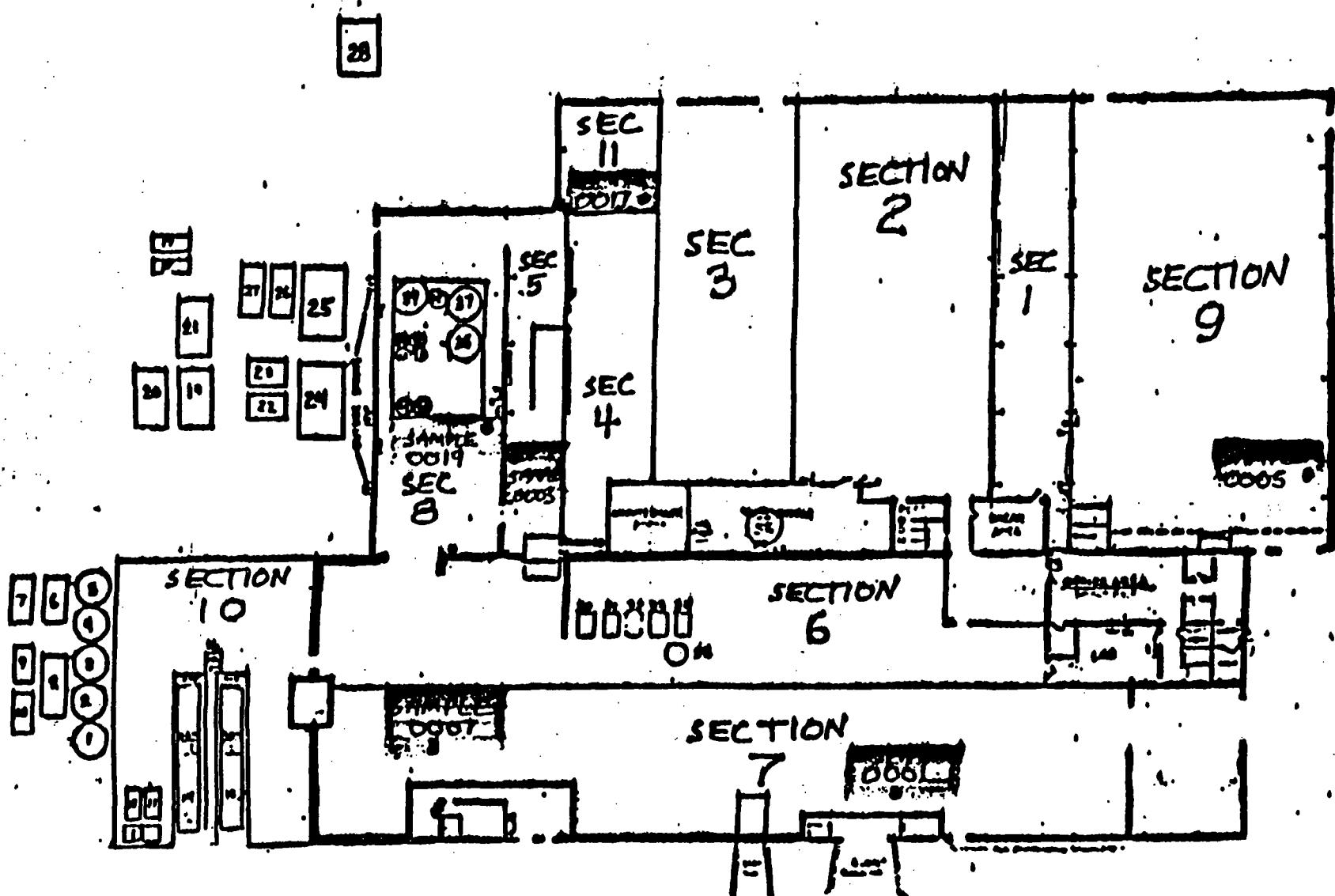
C-5

a. See separate diagram for location.

b. Samples collected by Chemical Waste Management Inc. and

FIGURE C-3

DIAGRAM SHOWING SAMPLE LOCATIONS OF AIR MONITORING INSIDE MAIN BUILDING  
ROSE CHEMICALS SITE - HOLDEN, MO



**APPENDIX F**

**JOHN MATHES & ASSOCIATES, INC.  
SURFACE SOIL ANALYTICAL RESULTS**



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)  
P. O. Box 330 COMPLETED: September 8, 1987  
Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
4 SS #1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

  
Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
4 SS #1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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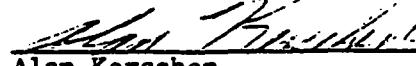
## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (4:00 pm)  
P. O. Box 330 COMPLETED: September 8, 1987  
Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

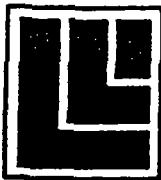
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
3 SS #2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

  
Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
3 SS #2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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P. O. Box 330 COMPLETED: September 8, 1987  
Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
2 SS #3	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
2 SS #3	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
1 SS #4	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloroproppane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

*Alan Kerschen*  
Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
1 SS #4	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg



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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.  
P. O. Box 330  
Columbia, IL 62236-0330

ATTN: Jeffrey D. Young

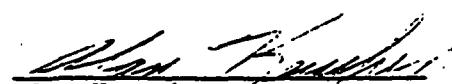
RECEIVED: September 1, 1987 (4:00 pm)  
COMPLETED: September 8, 1987

LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

  
Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	610 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xlenes	560 mg/kg



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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: September 1, 1987 (12:00 noon)  
P. O. Box 330 COMPLETED: September 16, 1987  
Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3658  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project  
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Antimony	6.1 mg/kg
	Arsenic	< 3.0 mg/kg
	Beryllium	0.44 mg/kg
	Cadmium	3.1 mg/kg
	Chromium	12.3 mg/kg
	Copper	20.4 mg/kg
	Lead	34 mg/kg
	Mercury	< 0.1 mg/kg
	Nickel	19.4 mg/kg
	Selenium	< 3.0 mg/kg
	Silver	0.50 mg/kg
	Thallium	6.4 mg/kg
	Zinc	165 mg/kg
	Cyanide	0.14 mg/kg
	Polychlorinated Biphenyls	
	Aroclor 1242	9.0 mg/kg
	Aroclor 1260	240 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project  
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Phenol	< 330 ug/kg
	bis(2-Chloroethyl)ether	< 330 ug/kg
	2-Chlorophenol	< 330 ug/kg
	1,3-Dichlorobenzene	< 330 ug/kg
	1,4-Dichlorobenzene	< 330 ug/kg
	Benzyl Alcohol	< 330 ug/kg
	1,2-Dichlorobenzene	< 330 ug/kg
	2-Methylphenol	< 330 ug/kg
	bis(2-Chloroisopropyl)ether	< 330 ug/kg
	4-Methylphenol	< 330 ug/kg
	n-Nitroso-di-n-propylamine	< 330 ug/kg
	Hexachloroethane	< 330 ug/kg
	Nitrobenzene	< 330 ug/kg
	Isophorone	< 330 ug/kg
	2-Nitrophenol	< 330 ug/kg
	2,4-Dimethylphenol	< 330 ug/kg
	Benzoic Acid	< 1,600 ug/kg
	bis(2-Chloroethoxy)methane	< 330 ug/kg
	2,4-Dichlorophenol	< 330 ug/kg
	1,2,4-Trichlorobenzene	< 330 ug/kg
	Naphthalene	< 330 ug/kg
	4-Chloroaniline	< 330 ug/kg
	Hexachlorobutadiene	< 330 ug/kg
	4-Chloro-3-methylphenol	< 330 ug/kg
	2-Methylnaphthalene	< 330 ug/kg
	Hexachlorocyclopentadiene	< 330 ug/kg
	2,4,6-Trichlorophenol	< 330 ug/kg
	2,4,5-Trichlorophenol	< 1,600 ug/kg
	2-Chloronaphthalene	< 330 ug/kg
	2-Nitroaniline	< 1,600 ug/kg
	Dimethylphthalate	< 330 ug/kg
	Acenaphthylene	< 330 ug/kg
	2,6-Dinitrotoluene	< 330 ug/kg

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project  
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	3-Nitroaniline	< 1,600 µg/kg
	Acenaphthene	< 330 µg/kg
	2,4-Dinitrophenol	< 1,600 µg/kg
	4-Nitrophenol	< 1,600 µg/kg
	Dibenzofuran	< 330 µg/kg
	2,4-Dinitrotoluene	< 330 µg/kg
	Diethylphthalate	< 330 µg/kg
	4-Chlorophenol-phenylether	< 330 µg/kg
	Fluorene	< 330 µg/kg
	4-Nitroaniline	< 1,600 µg/kg
	4,6-Dinitro-2-methylphenol	< 1,600 µg/kg
	N-Nitrosodiphenylamine	< 330 µg/kg
	4-Bromophenyl-phenylether	< 330 µg/kg
	Hexachlorobenzene	< 330 µg/kg
	Pentachlorophenol	< 1,600 µg/kg
	Phenanthrrene	< 330 µg/kg
	Anthracene	< 330 µg/kg
	Di-n-butylphthalate	< 330 µg/kg
	Fluoranthene	< 330 µg/kg
	Pyrene	< 330 µg/kg
	Butylbenzylphthalate	< 330 µg/kg
	3,3'-Dichlorobenzidine	< 660 µg/kg
	Benzo(a)anthracene	< 330 µg/kg
	Chrysene	< 330 µg/kg
	bis(2-Ethylhexyl)phthalate	< 330 µg/kg
	Di-n-octylphthalate	< 330 µg/kg
	Benzo(b)fluoranthene	< 330 µg/kg
	Benzo(k)fluoranthene	< 330 µg/kg
	Benzo(a)pyrene	< 330 µg/kg
	Indeno(1,2,3-cd)pyrene	< 330 µg/kg
	Dibenz(a,h)anthracene	< 330 µg/kg
	Benzo(g,h,i)perylene	< 330 µg/kg

SAMPLE DESCRIPTION: Sediment Sample Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop (Previous Project  
No. 87-3557)

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
5 SS #5	Pesticides	
	Aldrin	< 10 mg/kg
	Alpha-BHC	< 10 mg/kg
	Beta-BHC	< 10 mg/kg
	Gamma-BHC	< 10 mg/kg
	Delta-BHC	< 10 mg/kg
	Chlordane	< 10 mg/kg
	4,4'-DDT	< 10 mg/kg
	4,4'-DDE	< 10 mg/kg
	4,4'-DDD	< 10 mg/kg
	Dieldrin	< 10 mg/kg
	Alpha-Endosulfan	< 10 mg/kg
	Beta-Endosulfan	< 10 mg/kg
	Endosulfan Sulfate	< 10 mg/kg
	Endrin	< 10 mg/kg
	Endrin Aldehyde	< 10 mg/kg
	Heptachlor	< 10 mg/kg
	Heptachlor Epoxide	< 10 mg/kg
	Toxaphene	< 10 mg/kg
	Methoxychlor	< 10 mg/kg



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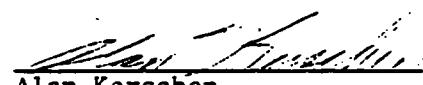
## LABORATORY REPORT

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P. O. Box 330 COMPLETED: September 8, 1987  
Columbia, IL 62236-0330  
ATTN: Jeffrey D. Young LLI NO.: 87-3557  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
6 SS #6	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloroproppane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

  
Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Sediment Samples Collected from Rose Chemical, Holden, MO  
on September 1, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
6 SS #6	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg

**APPENDIX G**

**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
SEDIMENT AND WATER ANALYTICAL RESULTS**

JOHN ASHCROFT  
Governor



FREDERICK A. BRUNNER  
Director

Division of Energy  
Division of Environmental Quality  
Division of Geology and Land Survey  
Division of Management Services  
Division of Parks and  
Historic Preservation

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176  
Jefferson City, MO 65102  
314-751-3241

LABORATORY SERVICES PROGRAM  
RESULT OF SAMPLE ANALYSIS

Sample No. 85-6432

Reported to: JAMES PENFOLD  
Affiliation: WPCR

Date: 9/25/85  
Project Code: 3227/3000

Sample Description:

SEDIMENT SAMPLE FROM THE TRIB. TO THE EAST BRANCH TO PIN  
OAK CREEK AT ROSE CHEM. PROPERTY LINE, GRAB SAMPLE from East side of  
Anderson property at property line.

Collected by: DON BOOS  
Affiliation: WPCR

Date: 09/18/85

PARAMETERS

RESULTS

PCB-1016	Not Analyzed
PCB-1221	Not Analyzed
PCB-1232	Not Analyzed
PCB-1242	Not Analyzed
PCB-1254	460 ug/Kg
PCB-1248	Not Analyzed
PCB-1260	Not Analyzed

Comments : Not a dry weight calculation.

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA Manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director  
Laboratory Services Program  
Division of Environmental Quality

JOHN ASHCROFT  
Governor

FREDERICK A. BRUNNER  
Director



Division of Energy  
Division of Environmental Quality  
Division of Geology and Land Survey  
Division of Management Services  
Division of Parks and  
Historic Preservation

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES



MEMORANDUM

*samples taken 10/2*

DATE: November 22, 1985  
*314-751-1820*

TO: Jim Penfold, Chief, Compliance/Review Section

FROM: Connie Knight, Supervisor Chemical Analysis Section

SUBJECT: Holden, Missouri PCB's

Analytical results for a series of samples collected at Holden, Missouri by Larry Alderson are given below. The samples were analyzed by GC/ECD and quantitated as Arochlor 1254. Any other arochlors which may be present were not quantitated or identified. Because of matrix interferences which were present in some of the samples the listed detection limits vary over a considerable range. Those samples marked with an asterisk (\*) may possibly contain some degraded arochlors that could not be identified by the method employed. A derivatization technique will be performed to obtain additional confirmation of the presence of PCB's, however the results will not be arochlor specific but will confirm the presence of any of the arochlor isomers.

$$\text{mg/Kg} = \text{ppm}$$
$$\text{mg/Kg} = \text{ppb}$$
$$1 \text{L} = 1000 \text{ g}$$
$$= \text{Kg}$$
$$\text{mg/L} = \text{ppb}$$

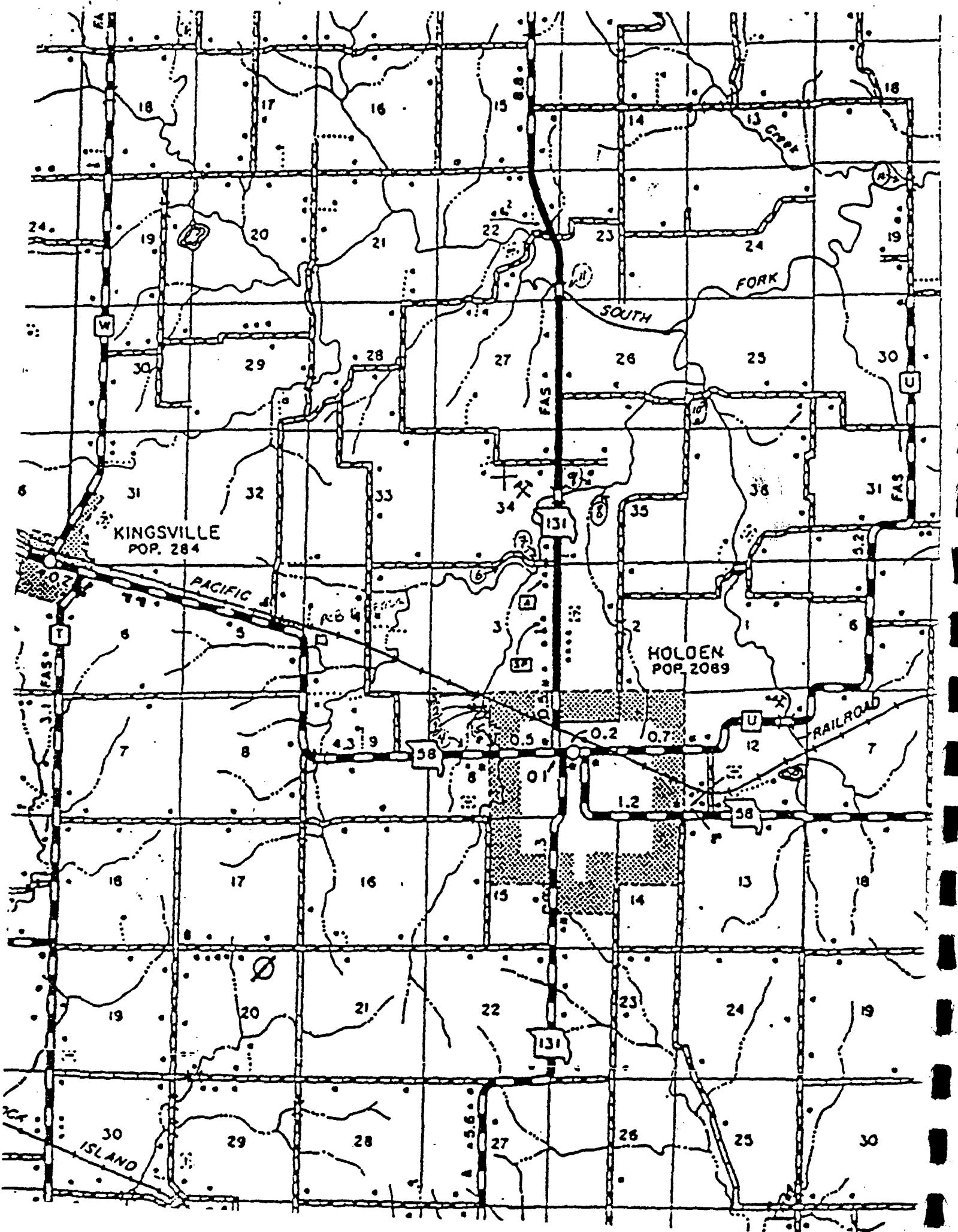
<u>Sample #</u>	<u>Description</u>	<u>Arochlor 1254</u>
*85-7556	Holden Sewage Treatment Influent.	<4.0 ug/l
85-7557	Holden Sewage Treatment Effluent.	1.0 ug/l
85-7558	Sample of seep over trunk line.	<0.4 ug/l
85-7559	Sediment sample from tributary below Rose Chemical.	approximately within 5% of actual measured 860 ug/Kg
*85-7560	Water sample from tributary below Rose Chemical.	<0.4 ug/l
	Sediment sample from E. Branch Pin Oak above sewage treatment	approximately within 5% of actual measured 1700 ug/Kg
85-7561	Water sample from E. Branch Pin Oak above sewage treatment plant.	<0.4 ug/l

Memo to Jim Penfold  
November 22, 1985  
Page Two

<u>Sample #</u>	<u>Description</u>	<u>Arochlor 1254</u>
3 { 85-7563	Water sample from E. Branch Pin Oak below sewage treatment plant effluent.	< 0.8 ug/l
3 } 85-7564	Sediment sample from E. Branch Pin Oak below sewage treatment plant effluent.	approximately 430 ug/Kg
4 { 85-7565	Water sample from E. Branch Pin Oak at Highway 58 Bridge.	< 0.4 ug/l
4 } 85-7566	Sediment sample from E. Branch Pin Oak at Highway 58 Bridge.	< 430 ug/Kg
5 { 85-7567	Water sample from tributary above Rose Chemical	< 0.4 ug/l
5 } *85-7568	Sediment sample from tributary above Rose Chemical.	< 430 ug/Kg
*85-7569	Water sample from sewer manhole on Highway 58.	< 4.0 ug/l
85-7570	Water sample from manhole southwest of main building Rose Chemical.	8.8 ug/l
85-7571	Water from manhole upstream east of Rose Chemical.	<4.0 ug/l
85-7572	Soil sample - composite of 5 aliquots from Gene Bore property.	<430 ug/Kg
85-7573	Soil sample - composite of 5 aliquots from Ivan Tompkins property.	<43 ug/Kg
85-7574	Soil sample - composite of 5 aliquots from Carol Stout property.	approximately 1300 ug/Kg
85-7575	Soil sample - composite of 5 aliquots from Terry Kennedy property.	<43 ug/Kg
85-7576	Soil sample - composite of 5 aliquots from Hatfield.	<43 ug/Kg

Memo to Jim Penfold  
November 22, 1985  
Page Three

<u>Sample #</u>	<u>Description</u>	<u>Arochlor 1254</u>
6 - 85-7577	Water sample W. Branch Pin Oak 1/3 mile above confluence of E. Branch.	< 0.4 ug/l
7 - 85-7579	Water sample Pin Oak below confluence of West Branch.	< 0.8 ug/l
8 { 85-7581	Water sample above confluence of N. flowing tributary and Pin Oak Creek (center of section 35 T46N R28W).	< 0.4 ug/l
85-7582	Sediment sample above confluence of N. flowing tributary and Pin Oak Creek (center of Section 35 T46N R28W).	< 43 ug/Kg
9 { 85-7583	Water sample Pin Oak Creek above N. flowing tributary (section 35).	< 0.4 ug/l
85-7584	Sediment sample Pin Oak Creek above confluence of N. flowing tributary (section 35).	< 43 ug/Kg
10 { 85-7585	Water sample tributary above Pin Oak Creek at County Road Bridge (section 25 T46N R28W).	< 0.4 ug/l
85-7586	Sediment sample tributary above Pin Oak Creek at County Road Bridge (section 25 T46N R28N).	< 43 ug/Kg
11 { 85-7587	South Fork Blackwater River water sample.	< 0.4 ug/l
85-7588	South Fork Blackwater River sediment sample.	< 43 ug/Kg
12 { 85-7589	South Fork Blackwater River Bridge water sample (section 19 T46 N R27W).	< 1.2 ug/l
85-7590	South Fork Blackwater River Bridge Sediment sample (section 19 T46N R27W).	< 43 ug/Kg

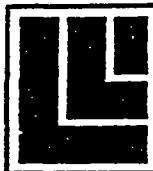


**APPENDIX H**

**JOHN MATHES & ASSOCIATES, INC.  
TEST BOREHOLE ANALYTICAL RESULTS**

**SAMPLE DESCRIPTION:** Soil Samples Collected from Rose Chemical, Holden, MO  
on June 10, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB1-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: June 10, 1987 (5:20 pm)  
P. O. Box 216 COMPLETED: June 22, 1987  
Holden, MO 64040  
ATTN: Jeffrey D. Young LLI NO.: 87-2636  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 10, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB1-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 10, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB1-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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on June 10, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB1-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 10, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB1-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.      RECEIVED: June 15, 1987 (5:00 pm)  
P. O. Box 216      COMPLETED: June 23, 1987  
Holden, MO 64040  
ATTN: Jeffrey D. Young      LLI NO.: 87-2669  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
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SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
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<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

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SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-2	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

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SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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ATTN: Jeffrey D. Young LLI NO.: 87-2669  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-4	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-4	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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ATTN: Jeffrey D. Young PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-5	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 15, 1987 by Thomas E. Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB2-5	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: June 9, 1987 (4:45 pm)  
P. O. Box 216 COMPLETED: June 22, 1987  
Holden, MO 64040  
ATTN: Jeffrey D. Young LLI NO.: 87-2610  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB3-1	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB3-1	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

## LABORATORY REPORT

**CLIENT:** John Mathes & Associates, Inc.  
P. O. Box 216  
Holden, MO 64040

**ATTN:** Jeffrey D. Young

**RECEIVED:** June 9, 1987 (4:45 pm)  
**COMPLETED:** June 22, 1987

**LLI NO.:** 87-2610  
**PROJECT NO.:** 12872844

**SAMPLE DESCRIPTION:** Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

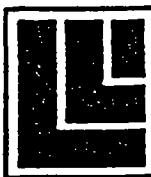
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB3-1D	Chloromethane	< 1.0 mg/kg
	Bromomethane	< 1.0 mg/kg
	Vinyl Chloride	< 1.0 mg/kg
	Chloroethane	< 1.0 mg/kg
	Methylene Chloride	< 0.50 mg/kg
	Trichlorofluoromethane	< 0.50 mg/kg
	1,1-Dichloroethene	< 0.50 mg/kg
	1,1-Dichloroethane	< 0.50 mg/kg
	1,2-Dichloroethene (total)	< 0.50 mg/kg
	Chloroform	< 0.50 mg/kg
	1,2-Dichloroethane	< 0.50 mg/kg
	1,1,1-Trichloroethane	< 0.50 mg/kg
	Carbon Tetrachloride	< 0.50 mg/kg
	Bromodichloromethane	< 0.50 mg/kg
	1,2-Dichloropropane	< 0.50 mg/kg
	cis-1,3-Dichloropropene	< 0.50 mg/kg
	Trichloroethene	< 0.50 mg/kg
	Dibromochloromethane	< 0.50 mg/kg
	1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

**SAMPLE DESCRIPTION:** Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB3-1D	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: June 9, 1987 (4:45 pm)  
P. O. Box 216 COMPLETED: June 22, 1987  
Holden, MO 64040  
ATTN: Jeffrey D. Young LLI NO.: 87-2610  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

### SAMPLE IDENTIFICATION

TR3-2

### ANALYSIS

Chloromethane	< 1.0 mg/kg
Bromomethane	< 1.0 mg/kg
Vinyl Chloride	< 1.0 mg/kg
Chloroethane	< 1.0 mg/kg
Methylene Chloride	< 0.50 mg/kg
Trichlorofluoromethane	< 0.50 mg/kg
1,1-Dichloroethene	< 0.50 mg/kg
1,1-Dichloroethane	< 0.50 mg/kg
1,2-Dichloroethene (total)	< 0.50 mg/kg
Chloroform	< 0.50 mg/kg
1,2-Dichloroethane	< 0.50 mg/kg
1,1,1-Trichloroethane	< 0.50 mg/kg
Carbon Tetrachloride	< 0.50 mg/kg
Bromodichloromethane	< 0.50 mg/kg
1,2-Dichloropropane	< 0.50 mg/kg
cis-1,3-Dichloropropene	< 0.50 mg/kg
Trichloroethene	< 0.50 mg/kg
Dibromochloromethane	< 0.50 mg/kg
1,1,2-Trichloroethane	< 0.50 mg/kg

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Soil Samples Collected from Rose Chemical, Holden, MO  
on June 9, 1987 by Jeffrey D. Young

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
TB3-2	Benzene	< 0.50 mg/kg
	trans-1,3-Dichloropropene	< 0.50 mg/kg
	Bromoform	< 0.50 mg/kg
	2-Chloroethylvinylether	< 0.50 mg/kg
	Tetrachloroethene	< 0.50 mg/kg
	1,1,2,2-Tetrachloroethane	< 0.50 mg/kg
	Toluene	< 0.50 mg/kg
	Chlorobenzene	< 0.50 mg/kg
	Ethylbenzene	< 0.50 mg/kg
	Styrene	< 0.50 mg/kg
	Total Xylenes	< 0.50 mg/kg
	Polychlorinated Biphenyls	< 0.2 mg/kg

**APPENDIX I**

**JOHN MATHES & ASSOCIATES, INC.  
SHALLOW SOIL BORINGS ANALYTICAL  
RESULTS**

Table 7

**ROSE CHEMICAL SITE  
SHALLOW SOIL SAMPLES  
ANALYTICAL RESULTS**

Parameter	Concentration (mg/kg)									
	SB-6 (0"-20")	SB-6 (20"-40")	SB-7 (0"-20")	SB-7 (20"-40")	SB-11 (0"-20")	SB-11 (20"-40")	SB-12 (0"-20")	SB-12 (20"-40")	SB-16 (0"-20")	SB-16 (20"-40")
PCBs										
Arochlor 1242	1.70	ND	ND	ND	0.46	ND	57.00	ND	1.90	ND
Arochlor 1260	12.00	ND	ND	ND	2.20	ND	32.00	ND	0.70	ND
Volatile Organics										
1,1-DCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCE	ND	ND	170.00	8.40	ND	ND	ND	ND	ND	ND
toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: 1. DCE - dichloroethene  
 2. DCA - dichloroethane  
 3. TCA - trichlorethane  
 4. TCE - trichloroethene  
 5. PCE - tetrachloroethene  
 6. Only data from those soil borings where contaminants were detected are shown in this table.

**APPENDIX J**

**JOHN MATHES & ASSOCIATES, INC.  
SHALLOW SOIL BORINGS IN MAIN  
BUILDING ANALYTICAL RESULTS**

Table 8

**ROSE CHEMICAL SITE  
WAREHOUSE SOIL SAMPLES  
ANALYTICAL RESULTS**

<u>Parameter</u>	<u>Concentration (mg/kg)</u>						
	<u>BS-2A</u>	<u>BS-3</u>	<u>BS-4</u>	<u>BS-5</u>	<u>BS-6</u>	<u>BS-7</u>	<u>BS-8</u>
<b>PCBs</b>							
Arochlor 1242	ND	0.80	ND	76.00	44.0	22.00	0.42
Arochlor 1254	260.00	ND	ND	ND	39.0	8.50	0.47
Arochlor 1260	ND	1.50	ND	227.00	ND	ND	
<b>Volatile Organics</b>							
1,1-DCE	ND	ND	1.30	ND	2.70	ND	16.00
1,1-DCA	ND	ND	ND	ND	68.00	ND	2.80
1,2-DCE	ND	ND	8.60	ND	0.37	ND	410.00
1,1,1-TCA	ND	ND	0.47	ND	ND	ND	16.00
TCE	ND	ND	ND	ND	ND	ND	110.00
PCE	ND	ND	ND	ND	ND	ND	2.70
toluene	ND	ND	ND	37.00	ND	ND	49.00
ethylbenzene	ND	ND	ND	105.00	ND	ND	0.90
xylenes	ND	ND	ND	403.00	ND	ND	1.50

- Notes:
1. DCE - dichloroethene
  2. DCA - dichloroethane
  3. TCA - trichlorethane
  4. TCE - trichloroethene
  5. PCE - tetrachloroethene
  6. Only those borings where contaminants were detected are shown in this table.

JULY/87/0082s

**APPENDIX K**

**JOHN MATHES & ASSOCIATES, INC.  
INTERIOR SOIL BORINGS TO BEDROCK  
ANALYTICAL RESULTS**

Table 3

**ROSE CHEMICAL FACILITY  
WAREHOUSE AREA SOIL SAMPLES  
PCB ANALYTICAL RESULTS**

Borehole Location	Sample Depth (feet)	PCBs Concentration (mg/kg)		dup
		Aroclor 1242	Aroclor 1260	
MWH-1	0.5 - 2.0	ND	0.3	ND ND
	2.0 - 3.5	ND	ND	
MWH-2	0.5 - 2.0	ND	ND	ND ND
	2.0 - 3.5	ND	ND	
MWH-3	0.5 - 2.0	0.23	0.41	.27 .13
	2.0 - 3.5	ND	ND	
MWH-4	0.5 - 2.0	ND	0.2	ND ND
	2.0 - 3.5	0.4	ND	
MWH-5	0.5 - 2.0	7.9	107	2.2 22
	2.0 - 3.5	9.0	100.0	
	3.5 - 5.0	ND	0.8	
MWH-6	0.5 - 2.0	1.2	1.2	ND ND
	2.0 - 3.5	0.59	0.50	
MWH-7	0.5 - 2.0	ND	ND	ND ND
	2.0 - 3.5	ND	ND	
MWH-8	0.5 - 2.0	ND	ND	ND ND
	2.0 - 3.5	ND	0.3	
MWH-9	0.5 - 2.0	ND	ND	ND ND
	2.0 - 3.5	ND	ND	
SWH-10	0.5 - 2.0	1.7	8.8	1.2 5.0
	2.0 - 3.5	ND	ND	
SWH-11	0.5 - 2.0	ND	ND	ND ND
	2.0 - 3.5	9.5	6.0	
	3.5 - 5.0	ND	ND	

Notes: MWH = sampling locations in the Main Warehouse.

SWH = sampling locations in the South Warehouse.

ND = specific Aroclor was not detected in the samples.

**APPENDIX L**

**JOHN MATHES & ASSOCIATES, INC.  
SOIL GAS ANALYTICAL RESULTS**

Table 3  
ROSE CHEMICAL SITE  
SOIL GAS DATA

Tracer Research Corporation

JOHN MATHEWS & ASSOCIATES-ROSE CHEMICAL-HOLDEN, MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylene (ug/l)	Total Hydrocar. (ug/l)
SG01	1.5'	06/03	0.02	0.004	0.002	<0.04	<0.04	<0.05	<0.04
SG02	2'	06/03	0.005	0.002	0.0008	<0.04	<0.04	<0.05	<0.04
SG03	2.5'	06/03	0.02	0.007	0.0004	<0.04	<0.04	<0.05	<0.04
SG04	3'	06/03	0.02	0.007	0.004	0.2	0.2	<0.05	0.4
SG05	2'	06/03	0.01	0.002	<0.00004	<0.04	<0.04	<0.05	<0.04
SG06	1.5'	06/03	0.002	0.006	<0.00009	<0.08	<0.08	<0.09	<0.08
SG07	3'	06/03	0.03	0.005	<0.00009	<0.04	<0.04	<0.05	<0.04
SG08	1.5'	06/03	0.0006	0.002	0.01	<0.08	<0.08	<0.09	<0.08
SG09	2'	06/03	1	0.01	0.3	<0.08	<0.08	<0.09	<0.08
SG10	2.5'	06/03	2	30	4	<0.08	<0.08	<0.09	16
SG11	1.5'	06/03	0.8	2	0.6	<0.08	<0.08	<0.09	1
SG12	1.5'	06/03	0.008	0.06	0.08	<0.08	<0.08	<0.09	<0.08
SG13	2'	06/03	3	45	2	<0.08	<0.08	<0.09	21
SG14	1.5'	06/04	0.002	<0.0003	<0.00009	<0.04	<0.04	<0.04	<0.04
SG15	1.5'	06/04	0.002	<0.0003	0.0001	<0.04	<0.04	<0.04	<0.04
SG16	1.5'	06/04	0.002	<0.0003	<0.0005	0.4	0.2	<0.04	1
SG17	2.5'	06/04	0.002	<0.0003	0.0004	<0.04	<0.04	<0.04	<0.04
SG18	3'	06/04	0.002	<0.0003	<0.0009	<0.04	<0.04	<0.04	<0.04
SG19	2.5'	06/04	0.006	<0.002	0.2	<0.04	<0.04	<0.04	<0.04
SG20	1.5'	06/04	0.0005	0.001	0.0004	<0.07	<0.08	<0.09	<0.07
SG21	2.5'	06/04	0.0006	<0.0003	<0.00009	<0.07	<0.08	<0.09	<0.07
SG22	2'	06/04	0.002	<0.0003	0.006	<0.04	<0.04	<0.04	<0.04
SG23	3'	06/04	0.002	0.4	0.2	22	4,200	12,000	14,000
SG24	4'	06/04	0.001	0.001	<0.0002	N/R	N/R	N/R	N/R
SG25	1.5'	06/05	0.002	0.006	<0.00008	N/R	N/R	N/R	N/R
SG26	1.5'	06/05	0.0006	<0.0003	0.0002	N/R	N/R	N/R	N/R
SG27	4'	06/05	0.2	0.1	2	N/R	N/R	N/R	N/R
SG28	5.5'	06/05	0.02	0.0007	0.002	N/R	N/R	N/R	N/R

Notations:

I = interference with adjacent peaks

Analyzed by M. Fayero

Table 3 (Continued)  
ROSE CHEMICAL SITE  
SOIL GAS DATA

Tracer Research Corporation

MATHEWS & ASSOCIATES-ROSE CHEMICAL-HOLDEN MISSOURI

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Xylenes (ug/l)	Total Hydrocarbons (ug/l)
SG29	5'	06/05	0.008	0.002	0.001	N/R	N/R	N/R	N/R
SG30	5.5'	06/05	0.001	0.002	0.0006	N/R	N/R	N/R	N/R
SG31	5'	06/05	0.002	0.002	0.0005	N/R	N/R	N/R	N/R
SG32	5'	06/05	0.001	0.002	<0.00008	N/R	N/R	N/R	N/R
SG33	5'	06/05	0.001	0.002	<0.00008	N/R	N/R	N/R	N/R
SG34	5'	06/05	0.002	0.002	0.001	N/R	N/R	N/R	N/R
SG35	5'	06/05	0.001	0.0008	0.0006	N/R	N/R	N/R	N/R
SG36	4'	06/05	0.0007	<0.0003	<0.00008	N/R	N/R	N/R	N/R
SG37	5'	06/05	0.0007	<0.0003	<0.00008	N/R	N/R	N/R	N/R
SG38	5'	06/05	0.001	0.001	0.0004	N/R	N/R	N/R	N/R
SG39	5'	06/05	0.002	0.002	0.0003	N/R	N/R	N/R	N/R

Notations:

Analyzed by M. Favero

**APPENDIX M**

**JOHN MATHES & ASSOCIATES, INC.  
GROUNDWATER ANALYTICAL RESULTS**



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.      RECEIVED: July 7, 1987 (4:35 pm)  
210 W. Sandbank Road      COMPLETED: July 10, 1987  
Columbia, IL 62236  
ATTN: Jeffrey D. Young      LLI NO.: 87-2883  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-101	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-101	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter



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## LABORATORY REPORT

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ATTN: Jeffrey D. Young LLI NO.: 87-2883  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

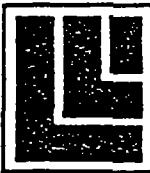
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-102	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-102	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 ug/liter



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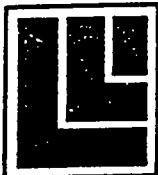
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-103	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 7, 1987 by Tom Fuhrhop/E. Ahlgren

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW-103	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 ug/liter



# LANGSTON LABORATORIES, INC.

Research • Testing • Problem Solving

RECEIVED SEP 22 1987

2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.      RECEIVED: August 28, 1987 (12:00 noon)  
210 W. Sandbank Road      COMPLETED: September 8, 1987  
Columbia, IL 62236  
ATTN: Jeffrey D. Young      LLI NO.: 87-3507  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on August 28, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 201	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	0.087 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	0.740 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on August 28, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 201	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls Aroclor 1260	0.68 mg/liter



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2005 W. 103rd Terrace (B) • Leawood, KS 66206-2695 • Ph. 913-341-7800

## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc.  
210 W. Sandbank Road  
Columbia, IL 62236

RECEIVED: July 2, 1987 (9:15 am)  
COMPLETED: July 10, 1987

ATTN: Jeffrey D. Young

LLI NO.: 87-2837  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 1, 1987 by Thomas Fuhrhop

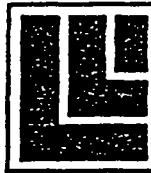
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 202	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 1, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 202	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter



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Research • Testing • Problem Solving

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## LABORATORY REPORT

CLIENT: John Mathes & Associates, Inc. RECEIVED: July 2, 1987 (9:15 am)  
210 W. Sandbank Road COMPLETED: July 10, 1987  
Columbia, IL 62236  
ATTN: Jeffrey D. Young LLI NO.: 87-2837  
PROJECT NO.: 12872844

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 1, 1987 by Thomas Fuhrhop

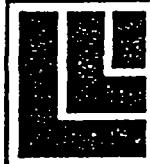
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 203	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 1, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 203	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter



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SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
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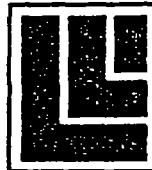
<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 252	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
	cis-1,3-Dichloropropene	< 0.005 mg/liter
	Trichloroethene	< 0.005 mg/liter
	Dibromochloromethane	< 0.005 mg/liter
	1,1,2-Trichloroethane	< 0.005 mg/liter

APPROVED:

Alan Kerschen  
Vice President

SAMPLE DESCRIPTION: Water Samples Collected from Rose Chemical, Holden, MO  
on July 1, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
MW 252	Benzene	< 0.005 mg/liter
	trans-1,3-Dichloropropene	< 0.005 mg/liter
	Bromoform	< 0.005 mg/liter
	2-Chloroethylvinylether	< 0.005 mg/liter
	Tetrachloroethene	< 0.005 mg/liter
	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 ug/liter



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on July 1, 1987 by Thomas Fuhrhop

<u>SAMPLE IDENTIFICATION</u>	<u>ANALYSIS</u>	<u>RESULTS</u>
Blank	Chloromethane	< 0.010 mg/liter
	Bromomethane	< 0.010 mg/liter
	Vinyl Chloride	< 0.010 mg/liter
	Chloroethane	< 0.010 mg/liter
	Methylene Chloride	< 0.005 mg/liter
	Trichlorofluoromethane	< 0.005 mg/liter
	1,1-Dichloroethene	< 0.005 mg/liter
	1,1-Dichloroethane	< 0.005 mg/liter
	1,2-Dichloroethene (total)	< 0.005 mg/liter
	Chloroform	< 0.005 mg/liter
	1,2-Dichloroethane	< 0.005 mg/liter
	1,1,1-Trichloroethane	< 0.005 mg/liter
	Carbon Tetrachloride	< 0.005 mg/liter
	Bromodichloromethane	< 0.005 mg/liter
	1,2-Dichloropropane	< 0.005 mg/liter
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	Bromoform	< 0.005 mg/liter
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	1,1,2,2-Tetrachloroethane	< 0.005 mg/liter
	Toluene	< 0.005 mg/liter
	Chlorobenzene	< 0.005 mg/liter
	Ethylbenzene	< 0.005 mg/liter
	Styrene	< 0.005 mg/liter
	Total Xylenes	< 0.005 mg/liter
	Polychlorinated Biphenyls	< 1.0 µg/liter

**APPENDIX N**

**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
ANIMAL TISSUE ANALYTICAL RESULTS**



# MISSOURI DEPARTMENT OF CONSERVATION

Fish and Wildlife Research Center • 1110 College Avenue  
Columbia, Missouri 65201 • Phone 314/449-3761  
LARRY R. CALE, Director

FILE

RECEIVED G 431

OCT 14 1987

J. M. CAMPBELL

March 28, 1986

Mr. Richard F. Rodman  
711 S. Olive  
Holden, MO 64040

Dear Dick:

Enclosed is a copy of the PCB data for fish collected from Pin Oak Creek and its tributaries. All samples were whole fish or whole frog composites. As I stated in our telephone conversation, we intend to collect additional fish samples in April or May.

If you have any questions concerning this information please feel free to contact me.

Sincerely,

James M. Czarnezki  
Water Quality Research Biologist

JMC:tja

Enclosure

MEETING WITH CITY FATHERS OF HOLDEN, MISSOURI  
April 6, 1986 12:30 to 2:00  
May

The City Fathers also told us about a lake north of Holden just off of Elizabeth Street which a local person had been fishing and had caught a transformer. Since that time one of the City Councilmen had been involved in hauling two transformers out of this particular lake. Mr. Richard Rodman, the City Councilman, gave us a copy of the Missouri Department of Conservation report dated March 28, 1986 which was signed by the water quality research biologist with data on PCB levels in tissue samples taken from this lake (copy of report attached).

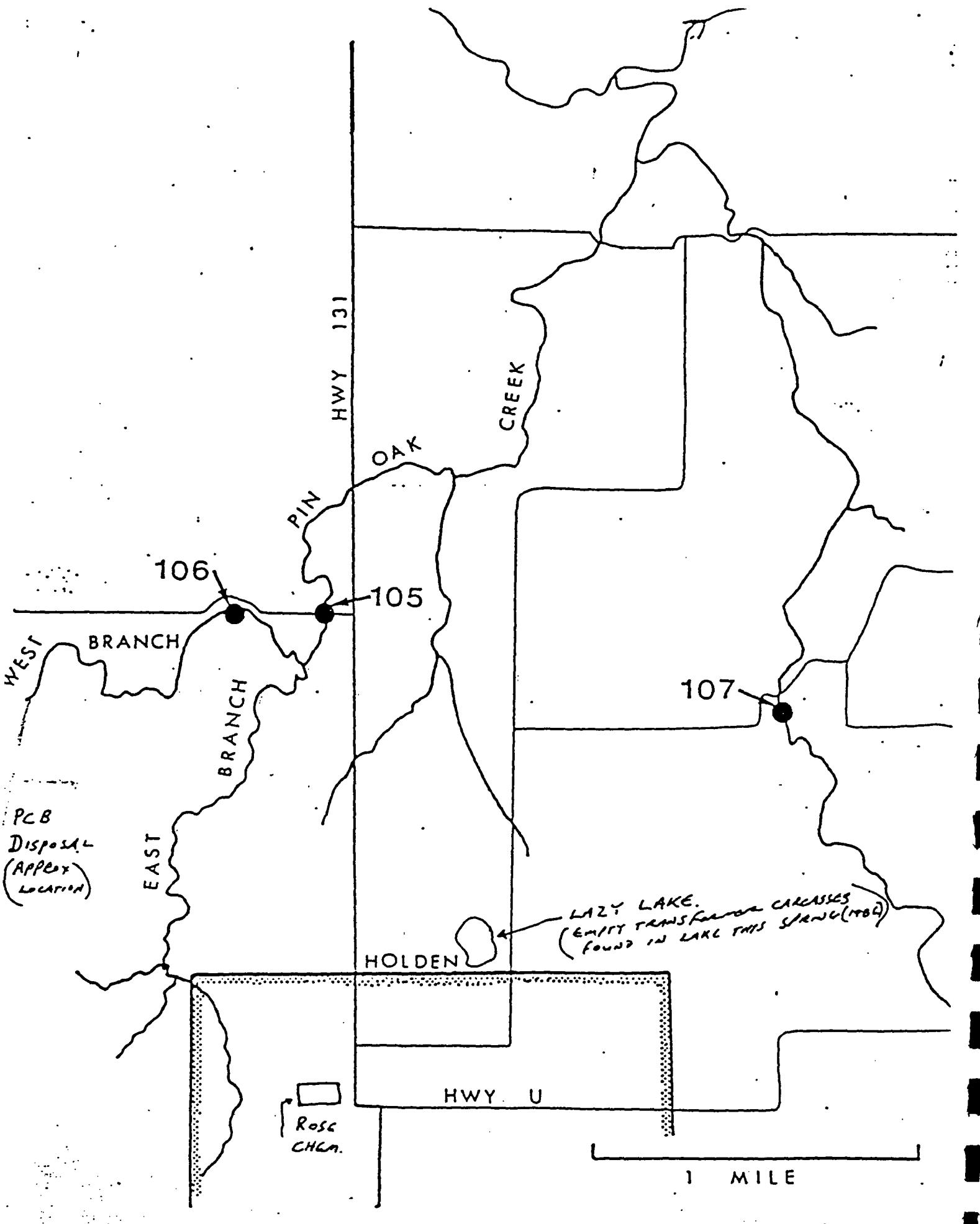
COMMISSION

EFF CHURAN  
Chillicothe

JOHN POWELL  
Rolla

JOHN B. MAHAFFEY  
Springfield

RICHARD T. REED  
East Prairie



## SUMMARY OF POLYCHLORINATED BIPHENYLS AND CHLORINATED PESTICIDE RESIDUE CONCENTRATIONS

(ug/Kg)

P C B 'S

Sample #	HCBD	Hepta-chlor	Aldrin	pp'DDE	Aroclor 1242	Aroclor 1254	Aroclor 1260	SAMPLE SIZE
BLACK BULLHEAD 5120629 105-L	<5.0	<5.0	<5.0	25.0	<50.0	<50.0	2754	6
5120630 105-S GREEN SUNFISH	<5.0	<5.0	<5.0	25.0	<50.0	<50.0	2061	12
5120631 105-W CREEK CHUBS	<5.0	<5.0	<5.0	31.7	<50.0	<50.0	1557	5
BUFFALO 5120632 105-FROG	<5.0	<5.0	<5.0	<5.0	<50.0	<50.0	<50.0	1
5120633 106-S GREEN SUNFISH	<5.0	<5.0	<5.0	6.2	<50.0	<50.0	591.0	5
5120634 106-H-1 STONEROLLERS	<5.0	<5.0	<5.0	22.1	<50.0	<50.0	1794.0	5
5120635 106-H-2 MINNOWS	<5.0	<5.0	<5.0	12.1	<50.0	<50.0	872.0	6
5120636 106-FROG	<5.0	<5.0	<5.0	22.1	<50.0	<50.0	2042.0	2
GREEN SUNFISH 5120637 107-5	<5.0	<5.0	<5.0	11.0	<50.0	<50.0	704.0	5
5120638 107-H-1 STONEROLLERS	<2.0	<2.0	<2.0	<2.0	<50.0	<50.0	<50.0	9
5120639 107-H-2 CREEK CHUB	<2.0	<2.0	<2.0	<2.0	<50.0	<50.0	<50.0	1
5120640 107-FROG	<2.0	<2.0	<2.0	<2.0	<50.0	<50.0	<50.0	2

ALL READINGS IN PARTS PER BILLION. TO CONVERT TO PPM, ADD THREE ZEROS IN FRONT. SAMPLE 105-L (AROC.1260) ABOVE WOULD READ .0002754 PPM.

## SUMMARY OF CHLORINATED PESTICIDE RESIDUE CONCENTRATIONS (µg/Kg)

	oDHC	γDHC	βDHC	δDHC	Lept. Epox.	Chlor- danes	Dieldrin	Endrin	pp'DDD	pp'DDT	Methoxy- chlor
5120629 105-L BLACK BULLHEAD	<2.0	<2.0	<5.0	<2.0	43.5	1026	26.8	<2.0	220.0	<5.0	<10.0
5120630 105-S GREEN SUNFISH	<2.0	<2.0	<5.0	<2.0	96.6	420	55.3	<2.0	205.0	<5.0	<10.0
5120631 105-W CREEK CHUB	<2.0	<2.0	<5.0	<2.0	51.2	563	293.0	<2.0	120.0	<5.0	<10.0
5120632 105-FROG	<2.0	<2.0	<5.0	<2.0	31.1	81.2	7.7	<2.0	20.6	<5.0	<10.0
5120633 106-S GREEN SUNFISH	<2.0	<2.0	<5.0	<2.0	7.8	54.7	13.7	<2.0	25.0	<5.0	<10.0
STONE ROLLER											
5120634 106-W-1	<2.0	<2.0	<5.0	<2.0	87.1	450.0	48.8	<2.0	325.0	<5.0	<10.0
NINNOMAN											
5120635 106-W-2	<2.0	<2.0	<5.0	<2.0	14.3	166.0	17.6	<2.0	50.0	<5.0	<10.0
5120636 106-FROG	<2.0	<2.0	<5.0	<2.0	49.2	694.0	28.3	<2.0	341.0	<5.0	<10.0
GREEN SUNFISH											
5120637 107-5	<2.0	<2.0	<5.0	<2.0	14.3	103.1	16.7	<2.0	83.5	<5.0	<10.0
STONE ROLLER											
5120638 107-W-1	<2.0	<2.0	<5.0	<2.0	6.9	96.8	21.8	<2.0	50.0	<10.0	<20.0
5120639 107-W-2 CREEK CHUB	<2.0	<2.0	<5.0	<2.0	<2.0	54.7	6.9	<2.0	12.5	5.2	<10.0
5120640 107 FROG	<2.0	<2.0	<5.0	<2.0	15.7	25.0	5.0	<2.0	37.5	97.5	<10.0

## KINGSVILLE QUADRANGLE

MISSOURI

7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

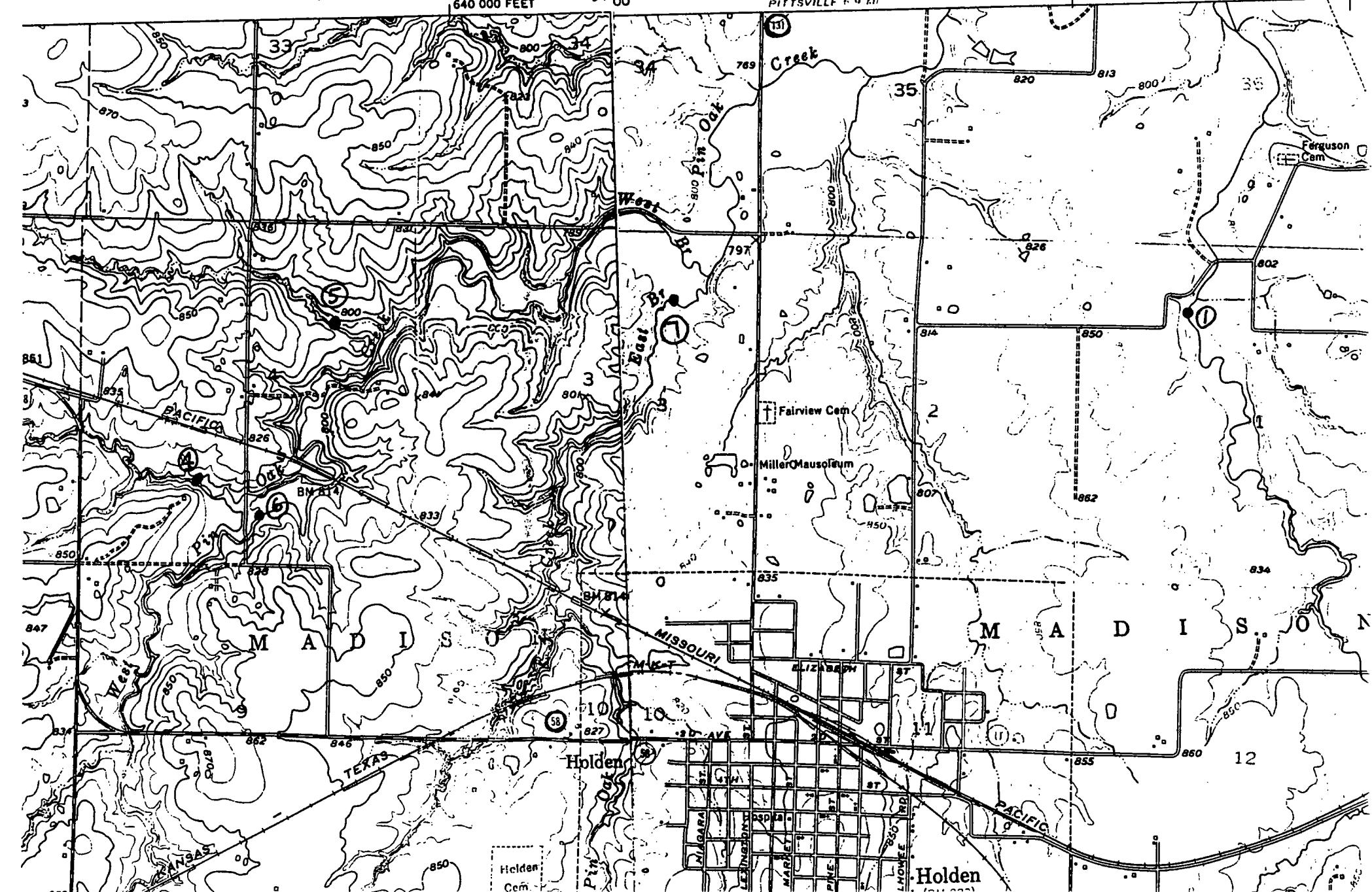
(2) and (3)

640 000 FEET

94°00'

ODESSA 16 MI  
PITTSVILLE 6 MI

57'30"



Appendix I. Contaminant data collected by the Missouri Department of Conservation in 1986.

COUNTY	WATERBODY/SITE	SPECIES	PREP	AVG-L (in)	AVG-W (g)	%	PAT	CONFOUNDA NT (ug/kg)													
								ALDR	BHC	CHLOR	DOD	DDE	DDT	DIEL	ENDR	HCB	HEPT	HEPX	1,260	Cd	Hg
Jefferson	Meramec River/Hwy 61-67	Channel Catfish	SFC	12.1	226	0.2	<2	<2	229	17	<5	20	20	<5	<2	<2	<2	136	<2	78	20
Jefferson	Meramec River/Hwy 61-67	Largemouth Bass	SFC	13.4	507	3.1	<2	<2	61	7	<5	<10	3	<5	<2	<2	<2	<50	<2	200	<20
Jefferson	Meramec River/Hwy 61-67	Smallmouth Buffalo	SFC	13.4	563	0.8	<2	<2	75	5	<5	<10	2	<5	<2	<2	<2	<50	<2	110	92
Jefferson	Meramec River/Hwy 61-67	White Bass	SFC	11.2	336	0.5	<2	<2	413	12	<5	<10	4	<5	<2	<2	3	142	<2	130	60
Johnson	E Br Pin Oak Creek	Crayfish	SFC	4.0	0	1.7	15	<2	152	<5	5	<10	7	<5	<2	14	20	522	72	26	150
Johnson	E Br Pin Oak Creek	Creek Chub	SFC	4.3	0	0.9	63	<2	253	<5	42	<10	40	<5	6	51	50	2506	150	60	<50
Johnson	E Br Pin Oak Creek	Green Sunfish	SFC	3.7	0	2.7	55	<2	646	<5	27	<10	7	<5	5	80	72	2556	52	55	<50
Johnson	E Br Pin Oak Creek	Sediment	SFC	0.0	0	0.0	<1	<1	27	<2	<2	<1	<2	<1	<1	<1	<1	20	1000	40	25000
Johnson	E Br Pin Oak Creek	Shiner species	SFC	3.8	0	0.6	73	<2	1371	160	55	<10	79	<5	10	99	75	3487	110	60	400
Johnson	E Br Pin Oak Creek	Tadpole	SFC	5.3	0	1.8	79	<2	1851	11	45	<10	38	<5	9	136	96	3781	160	21	1400
Johnson	Jonathan Scott Pond/Holden	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<5	<1	<2	<1	<1	<1	<10	300	40	27000
Johnson	Jonathan Scott Pond/Holden	Water	SFC	0.0	0	0.0	<>	<0.01	<0.05	<0.02	<>	<0.02	<0.01	<0.02	<>	<>	<0.01	<>	<0.3	<0.05	<0.2
Johnson	Lake Butte/Knob Muster SP	Largemouth Bass	SFC	17.2	1218	10.4	<2	<2	423	<5	19	<10	18	<5	<2	<2	13	<50	<4	870	<40
Johnson	Lake Butte/Knob Muster SP	Yellow Bullhead	SFC	10.1	257	5.0	<2	<2	128	<5	<5	<10	4	<5	<2	<2	<2	<50	<3	260	<30
Johnson	Lasy Lake/Holden	Black Bullhead	SFC	10.0	252	2.4	<2	<2	<5	<5	<5	<10	42	<5	<2	<2	<2	<50	380	140	80
Johnson	Lasy Lake/Holden	Bluegill	SFC	5.5	55	2.1	<2	<2	<5	<5	<5	<10	12	<5	<2	<2	<2	<50	270	150	60
Johnson	Lasy Lake/Holden	Largemouth Bass	SFC	14.7	641	1.1	<2	<2	<5	<5	<5	<10	12	<5	<2	<2	<2	<50	10	840	40
Johnson	Lasy Lake/Holden	Sediment	SFC	0.0	0	0.0	<>	<1	<5	<2	<>	<2	<2	<2	<2	<2	<2	<2	<50	50	22000
Adams	NFT Pin Oak Creek/Unnamed 3a upstream	Black Bullhead	SFC	8.1	0	1.6	<2	<2	<5	<5	<5	<10	33	<5	<2	<2	<2	<50	<6	110	160
Johnson	NFT Pin Oak Creek/Unnamed 3a upstream	Crayfish	SFC	4.3	0	1.3	<2	<2	<5	<5	<5	<10	45	<5	<2	<2	<2	<50	70	24	220
Johnson	NFT Pin Oak Creek/Unnamed 3a upstream	Creek Chub	SFC	5.6	0	1.5	2	<2	34	<5	8	<10	23	<5	<2	3	3	52	26	49	<40
Johnson	NFT Pin Oak Creek/Unnamed 3a upstream	Green Sunfish	SFC	5.1	0	1.1	16	<2	256	<5	6	<10	12	<5	<2	20	34	534	10	73	<50
Johnson	NFT Pin Oak Creek/Unnamed 3a upstream	Sediment	SFC	0.0	0	0.0	<>	<1	10	<2	<>	<2	<1	<2	8	15	11	<>	910	<30	31000
Johnson	S Fk Blackwater River/Above Pin Oak Cr	Channel Catfish	SFC	6.7	0	1.5	<2	<2	48	<5	6	<10	5	<5	<2	<2	<2	<50	100	57	230
Johnson	S Fk Blackwater River/Above Pin Oak Cr	Crayfish	SFC	3.1	0	1.2	<2	<2	<5	<5	<5	<10	12	<5	<2	<2	<2	<50	150	16	100
Johnson	S Fk Blackwater River/Above Pin Oak Cr	Green Sunfish	SFC	5.9	0	1.1	9	<2	117	<5	9	<10	12	<5	2	13	14	364	10	70	60
Johnson	S Fk Blackwater River/Above Pin Oak Cr	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<2	<1	<2	<1	<1	<1	<10	380	40	17000
Johnson	S Fk Blackwater River/Above Pin Oak Cr	Shiner species	SFC	3.0	0	1.3	16	<2	292	<5	12	<10	20	<5	<2	21	11	493	72	46	<50
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Tadpole	SFC	4.3	0	0.7	<2	<2	<5	<5	<5	<10	12	<5	<2	<2	<2	<50	210	23	1300
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Carp	SFC	13.6	506	3.0	<2	<2	28	<5	<5	<10	4	<5	<2	4	84	33	100	<40	
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Carp	SFC	13.6	506	1.8	9	<2	81	<5	13	<10	14	<5	<2	6	4	390	82	56	100
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Channel Catfish	SFC	10.9	258	4.9	<2	<2	82	<5	<5	<10	23	<5	<2	6	50	56	72	60	
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Green Sunfish	SFC	6.0	89	2.0	<2	<2	11	<5	<5	<10	9	<5	<2	3	63	<4	92	<40	
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<2	<1	<2	<1	<1	<1	<10	590	<30	13000
Johnson	S Fk Blackwater River/Below Pin Oak Cr	Channel Catfish	SFC	8.3	164	1.0	<2	<2	62	<5	<5	<10	14	<5	<2	7	54	82	47	100	
Johnson	W Br Pin Oak Creek/Middle Fork N.F.	Black Bullhead	SFC	8.4	0	1.5	<2	<2	15	<5	<5	<10	15	<5	<2	<2	<2	<50	43	110	270
Johnson	W Br Pin Oak Creek/Middle Fork N.F.	Creek Chub	SFC	6.6	0	1.5	8	<2	19	<5	5	<10	7	<5	<2	6	2	628	24	69	150
Johnson	W Br Pin Oak Creek/Middle Fork N.F.	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<2	<1	<2	<1	<1	<1	<10	1200	<30	67000
Johnson	W Br Pin Oak Creek/Middle Fork N.F.	Shiner species	10SFC	3.6	0	0.6	49	<2	78	<5	13	<10	15	<5	<2	59	4	2570	54	66	170
Johnson	W Br Pin Oak Creek/North fork	Black Bullhead	1WFC	6.7	0	1.6	<2	<2	45	<5	<10	<2	<5	<2	<2	<2	<2	<62	150	100	540
Johnson	W Br Pin Oak Creek/North fork	Green Sunfish	SFC	4.6	0	2.3	<2	<2	45	<5	<5	<10	42	<5	<2	<2	<2	<50	130	200	200
Johnson	W Br Pin Oak Creek/North fork	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<2	<1	<2	<1	<1	<1	<10	1300	<30	58000
Johnson	W Br Pin Oak Creek/North fork	Stoneroller	SFC	3.2	0	1.2	8	<2	44	<5	6	<10	11	<5	4	6	3	442	140	63	200
Johnson	W Br Pin Oak Creek/South Park	Black Bullhead	SFC	3.0	0	1.0	31	<2	21	<5	5	<10	29	<5	4	38	2	1740	33	48	40
Johnson	W Br Pin Oak Creek/South Park	Crayfish	SFC	3.6	0	1.3	7	<2	45	<5	<10	45	<5	<2	13	2	387	47	14	89	
Johnson	W Br Pin Oak Creek/South Park	Creek Chub	SFC	7.0	0	3.7	64	<2	42	<5	21	<10	29	<5	7	97	2	3862	93	61	100
Johnson	W Br Pin Oak Creek/South Park	Frog	SFC	0.0	0	0.7	5	<2	45	<5	<10	45	<5	<2	9	2	394	58	21	43	
Johnson	W Br Pin Oak Creek/South Park	Green Sunfish	SFC	4.2	0	2.2	36	<2	45	<5	12	<10	27	<5	<2	44	3	2172	60	63	<40
Johnson	W Br Pin Oak Creek/South Park	Sediment	SFC	0.0	0	0.0	<1	<1	<5	<2	<2	<2	<1	<2	<1	<1	<1	<33	610	<30	21000
Johnson	W Br Pin Oak Creek/South Park	Stoneroller	SFC	4.1	0	3.3	36	<2	60	<5	9	<10	40	<5	<2	25	3	2267	55	42	100
Knox	Henry Sever Lake/Henry Sever WA	Largemouth Bass	SFC	14.1	545	0.1	<2	<2	<10	<5	<5	<10	22	<5	<2	<2	<2	<50	2	540	<10
Knox	Henry Sever Lake/Henry Sever WA	White Crappie	SFC	9.6	182	0.1	<2	<2	<10	<5	<5	<10	42	<5	<2	<2	<2	<50	4	110	<10